

DAMSELFLIES (ZYGOPTERA)



Photo:K.A.Subramanian



Photo:Natasha Mahatre

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Photo:Natasha Mahatre

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MARSH DARTS (FAMILY: COENAGRIONIDAE)

Marsh darts are slender and small damselflies with varied colouration. These non-iridescent damselflies rest with wings closed over their body. The wings are transparent and rounded at the tip. The long and slender abdomen is slightly longer than the hind wing. Some of the smallest damselflies like the Golden Dartlet (*Ischnura aurora*) is from this family. Marsh Darts are found throughout the world. World over, this family is represented by about 1147 species. Within Indian limits, 65 species are known and in peninsular India 25 species are recorded. The marsh darts breed in a variety of aquatic habitats like ponds, marshes, streams and rivers. Though most of the species are closely associated with aquatic habitats, some species like the Common Marsh Dart (*Ceriagrion coromandelianum*) can be found far away from any aquatic habitat.



Golden Dartlets mating



Golden Dartlet- male

35. Pigmy Dartlet (*Agriocnemis pygmaea*)

Size: **Male:** Abdomen: 16-17mm, Hindwing: 9.5-10mm. **Female:** Abdomen: 18 mm, Hindwing: 11-12 mm.

Description: A small apple green damselfly with black thoracic stripes orange coloured terminal abdominal segments. **Male:** **Eyes:** Black above, pale apple green below. **Thorax:** Black above with pale apple green stripes on sides. The pale green colour along the sides fades to yellow below. Upper side of posterior lateral side has small black spot.



Photo:K.A.Subramanian

Male Pigmy Dartlet



Photo:K.A.Subramanian

Female Pigmy Dartlet (Red form)

Legs: Yellow, outer surface of femora black. **Wings:** Transparent. **Wing spot:** Pale yellow in forewings and black in hind wings. **Abdomen:** Broadly black above. Segment 1-6 with ground colour pale apple green. Terminal segments brick red.

Female: Shows range of colour variations, some even resemble the males. In red form (Photo) the head, thorax and abdomen are dark brick red in colour. Thorax has a broad, dorsal black band. **Habits and Habitat:** Common in marshes, ponds, and sea shore. Darts among vegetation and flies very close to the ground. **Breeding:** In marshes and ponds. **Flight Season:** Very common during October-January. **Distribution:** Throughout the Oriental, Australian regions and Pacific islands.

36. Orange-tailed Marsh Dart (*Ceriagrion cerinorubellum*)

Size: **Male:** Abdomen: 31-33mm, Hindwing: 20-21mm. **Female:** Abdomen: 31-35mm, Hindwing: 20-21mm.

Description: A medium sized pale green damselfly with orange coloured segments at the base and end of the abdomen. **Male:**

Eyes: Dark olivaceous above, pale green below.

Thorax: Green above fading to blue on the sides and yellow below. **Legs:**

Yellow, with short black spines. **Wings:**

Transparent. **Wing spot:** Amber coloured.

Abdomen: Multicoloured.

Segments 1-2 and 7-10 brick red. Central segments (3-7) blue grey with dorsal black band. **Female:** Very similar to the male, however, the red abdominal segments 7-10 are much duller. **Habits and Habitat:** Common on the banks of ponds, rivers and canals. Sits on dry twigs and vegetation over water. **Breeding:** Breeds in marshy banks of rivers, canals and ponds. **Flight season:** October-January. **Distribution:** Throughout the Oriental region.



Female Orange-tailed Marsh Dart



Male Orange-tailed Marsh Dart

Photo:K.A.Subramanian

Scan:K.A.Subramanian

37. Coromandel Marsh Dart (*Ceriagrion coromandelianum*)

Size: **Male:** Abdomen: 28-30mm, Hindwing: 18-20 mm. **Female:** Abdomen: 29-32 mm, Hindwing: 20mm

Description: A medium sized pale green damselfly with bright yellow (male) or pale green tail (female). **Male:**

Eyes: Olivaceous above, pale greenish yellow below.

Thorax: Olive green above merging to yellow on sides.

Underside is white. **Legs:** Yellow with black spines. **Wings:** Transparent. **Wing spot:** Golden yellow. **Abdomen:** Uniform yellow.

Female: **Thorax:** Golden brown. **Abdomen:** Uniformly olivaceous with an ochrous or golden brown tint on the dorsal side. **Habits and Habitat:** Common along the banks of ponds, rivers and canals. Also found frequently far away from water bodies. **Breeding:** Shallow water bodies with profuse growth of grass and other aquatic plants. **Flight season:** Throughout the year. **Distribution:** Throughout the Oriental region.



Photo:K.A.Subramanian

Coromandel Marsh Dart-male



Photo: Tarique Sani

Coromandel Marsh Darts mating
(male above and female below)

38. Rusty Marsh Dart (*Ceriagrion olivaceum*)

Size: **Male:** Abdomen: 34-38mm, Hindwing: 22-23mm. **Female:** Abdomen: 33-35mm, Hindwing: 22mm.

Description: A medium sized pale green or brown damselfly with rusty tail. **Male:** Eyes: Olivaceous brown.

Thorax: Upper side pale olivaceous, paler on the sides and beneath. **Legs:**

Yellow with black spines. **Wings:**

Transparent. **Wing spot:** Pale brown.

Abdomen: Uniform olivaceous brown, fading to yellowish beneath. **Female:** Very similar to the male. The race found in the Western Ghats



Photo:K.A.Subramanian

Rusty Marsh Dart



Photo:K.A.Subramanian

Rusty Marsh Dart (Western Ghats race)

(*C.o.aurantiacum*) has a reddish brown abdomen. **Habits and Habitat:** Very common among vegetation along the banks of streams. **Breeding:** Shaded streams. **Flight season:** September-December. **Distribution:** Western Ghats, North-east India and West Bengal.

39. Golden Dartlet (*Ischnura aurora*)

Size: **Male:** Abdomen: 16-20mm, Hindwing: 10-20mm. **Female:** Abdomen: 18-20mm, Hindwing: 14-15mm

Description: A

small apple green damselfly with black thoracic stripes and blue tipped yellow tail.

Male: Eyes: Black half moon like cap above, olive green to dark olive below, which fade to pale olive beneath. Two azure blue spots are present behind the eyes.

Thorax:

Shining black with two pale grass green stripes. Sides are light green and white below. **Legs:** Pale greenish white.

Wings: Transparent. **Wing spot:** The wing spots are different in fore and hindwings. It is rose-red in forewings and uniform pale grey in hindwings. **Abdomen:** Bright yellow. The second and seventh segments has upper narrow and broad black marks respectively. Segments 8-10 are entirely azure blue. The 10th segment has a upper black spot. **Female:** The female is less brightly coloured than the male. A broad black stripe runs along the upper side of abdomen. Segments 8-10 do not have azure blue markings. **Habits and Habitat:** Found among vegetation along the banks of ponds, rivers, canals and estuaries. **Breeding:** Among marshes on the banks of ponds, canals and rivers. **Flight season:** Throughout the year. **Distribution:** Oriental and Australian regions. Also found in remote oceanic islands probably carried by air currents.



Golden Dartlet - male



Mite infested female Golden Dartlet

40. Senegal Golden Dartlet (*Ischnura senegalensis*)

Size: **Male:** Abdomen: 21-23mm, Hindwing: 13-15mm. **Female:** Abdomen: 20-24mm, Hindwing: 14-16mm

Description: A small pale green damselfly with black and yellow thoracic stripes. Abdomen is yellow and has basal and terminal blue spots. **Male:** **Eyes:**

Upper side black; underside pale green to yellow. Two bright blue spot present behind the eyes. **Thorax:** Bronze backed with pale green sides and yellow underside. Narrow stripe on sides is pale green to bright yellow bordered by

a broad black band. **Legs:** Black, with yellow or pale green outer surface. The legs are covered short black spines. **Wings:** Transparent. **Wing spot:** Diamond shaped and black in forewing and dull white in the hindwing. **Abdomen:** The first segment is pale green and the second is azure blue with steel blue black on upper side. The segments 3-7 are bright yellow with black upper side. The eighth and ninth segments are azure blue with black upper side. The last segment has black upper side and yellow on sides. **Female:** Less brightly coloured than the male.

The eyes and spots behind the head are paler. The thorax has pale green stripe and brown band instead of yellow stripe and black band of male. The legs and abdomen are pale brown with black stripes. The abdomen lacks blue markings found in males. **Habits and Habitat:** Very common in marshes, ponds and wet grasslands. **Breeding:** Breeds in marshes and ponds. **Flight season:** Not known.

Distribution: Ethiopian and Oriental region. In the Western Ghats it is reported up to an altitude of 2300m ASL.



Senegal Golden Dartlets mating

Photo: Natasha Mahatre

41. Blue Grass Dartlet (*Pseudagrion microcephalum*)

Size: **Male:** Abdomen: 27mm, Hindwing: 17mm. **Female:** Abdomen: 29mm, Hindwing: 20mm.

Description: A small blue damselfly with broad blue medial thoracic stripe. **Male:**

Eyes: Brown cap above, dark azure blue below fading to sky blue beneath. **Thorax:** Azure blue with a broad black medial stripe. A black narrow stripe on each side. **Wings:** Transparent. **Legs:** Azure blue. **Wing spot:** Grey.

Abdomen: Azure blue. Second Segment with a goblet shaped black mark on the upper side. Segment 3-7 has a broad black markings above. Segment 8 has a thick ring towards the end and the 9th segment is unmarked. A broad saddle-shaped black mark is

present on the upper side of 10th segment. **Female:** **Eyes:** Pale blue beneath, olive green above. **Thorax:** Bluish green, golden orange above and azure blue on sides.

Wings: Transparent. **Wing spot:** Pale brown. **Abdomen:** Similar to male. Segment 2 has a thick dumbbell shaped above. The segments 8 and 9 have broad black stripe above and two tongue like spots respectively. The tenth segment is unmarked. **Habits and Habitat:** A species of the plains. Found commonly among vegetation covered banks of ponds, canals and rivers. **Breeding:** Among marshy banks of ponds, canals and rivers. **Flight season:** June-November. **Distribution:** Oriental and Australian region.



Photo: Natasha Mahatre

Blue Grass Dartlet



Scan:K.A.Subramanian

Blue Grass Dartlet dorsal view

42. Yellow-striped Blue Dart (*Pseudagrion indicum*)

Size: **Male:** Abdomen: 34mm, Hind wing: 22mm. **Female:** Abdomen: 32mm, Hind wing: 22mm

Description: A medium sized blue damselfly with black and yellow thoracic stripes. **Male:**

Eyes: Black above, greenish on sides and beneath.

Thorax: Azure blue with broad black medial. On the sides, it is azure blue with greenish yellow stripe and a narrow

black stripe. Rest of the thorax is azure blue with two black spots towards poster end.

Wings: Transparent. **Legs:** Pale azure blue and the outer surface of femora have a black band. **Wing spot:** Pale yellow. **Abdomen:**

Azure blue. Second segment has a broad 'V' shaped mark. The segment 3-7 has a broad black stripe above. The segment 8 and 9 are azure blue, with broad apical black rings. The 10th segment is black above. **Female:**

Eyes: Emerald green above with or without a small black cap. **Thorax:** Grass green above and pale yellowish green on sides.

This is marked with three fine black parallel lines above and a fine black line on sides. **Wings:** Transparent. **Wing spot:** Pale brown. **Abdomen:** The segments 1-

7 are similar to males. However, the 8 and 9th segments are black with a fine blue ring towards the end, and the 10th segment is black. **Habits and Habitat:**

Found in pools associated with hill streams. Usually perches on dry twigs near streams. **Breeding:** Marshes associated with hill streams. **Flight season:**

Throughout the year. **Distribution:** Endemic to the Western Ghats. This species is known from Chikmagalur, Kodagu (Karnataka) and Nilgiri (Tamil Nadu) districts.



Photo:K.A.Subramanian

Yellow-striped Blue Dart - male

43. Saffron-faced Blue Dart (*Pseudagrion rubriceps*)

Size: **Male:** Abdomen: 29mm, Hind wing: 18-20mm. **Female:** Abdomen: 29mm, Hind wing: 21mm.

Description: A medium sized blue damselfly with characteristic bright orange face. **Male:** **Eyes:**

Olivaceous green above, bright orange below and bluish beneath.

Thorax: Olivaceous green with azure blue sides. Median fine black line with broad black parallel line present on each side. On sides, a fine black line is present and the under side is white. **Wings:**

Transparent. **Legs:** Yellow. Femora black on outer and rear surfaces.

Wing spot: Reddish brown.

Abdomen: The segment 1-2 is olivaceous green above and azure blue on sides. The segment 3-7 is black, bronzed green above. The 8th segment has a broad black cone above and the 9th and 10th segments are azure blue. **Female:**

The face is rusty brown. **Eyes:** Dark blue above, azure blue below. **Thorax:**

Markings similar to male but the colour is dull bluish green. **Abdomen:** The markings above the segments broader than in males. The mark on 8th segment extends the whole length of the segment and 9th segment has basal forked markings above. **Habits and Habitat:** Frequents banks of large rivers. Usually perches on aquatic plants on the bank and is seen in small groups of 3-4 individuals. **Breeding:** Breed in marshes along the river bank. **Flight season:**

Throughout the year. **Distribution:** Oriental region.



Photo: John Moore

Saffron-faced Blue Dart - male



Photo: John Moore

Saffron-faced Blue Darts mating

BUSH DARTS (FAMILY: PLATYCNEMIDIDAE)

Bush Darts are small, slender damselflies. They are predominantly black damselflies with blue, red or yellow markings. The narrow, transparent wings are rounded at the tip. Abdomen is longer than the hindwing. Bush Darts are found only in Old World and 197 species are known from this region. Within Indian limits 30 species are known. Only two species are known from peninsular India and the rest of the species are found in the eastern Himalayas. Bush darts breed in small mountain streams and adults usually dart among riparian vegetation. Newly emerged Bush Darts are conspicuously white and without any marking.



Photo:K.A.Subramanian

Yellow Bush Darts mating

44 . Blue Bush Dart (*Copera vittata*)

Size: **Male:** Abdomen: 28-34mm, Hindwing: 16-18mm. **Female:** Abdomen: 28-30mm, Hindwing: 18mm

Description: A black band extend from eye to eye.

Male: Eyes: Black cap above, olivaceous green below with a black equatorial belt. Thorax: Black above, chocolate brown on sides with a few coarse yellow spots. A narrow yellow stripe beneath continuous as bluish or yellowish in front. Underside of the thorax is yellow. Legs: Reddish yellow. Wings: Transparent. Wing spot: Reddish brown.

Abdomen: Black above. The segments one and two reddish yellow.

Pale blue rings at the front end of segments 3-7. The segment 9 has a blue spot and segment 10 is entirely blue. **Female:** Eyes: Dark brown cap above with pale apple green below. The black equatorial belt present as in males. Thorax: Pale brown and marked similar to males. Wings: Transparent. Wing spot: Blackish brown. Legs: Yellow. **Abdomen**: Pale brown with dark purplish black. Segments 1-2 pale yellowish brown. Segment 3-7 with pale brown anterior rings. The 9th segment has a broad pale brown T-shaped mark. Segment 10 is pale brown.

Habits and Habitat: Found along ponds, puddles, canals and streams. Flies very close to the ground (<1m). **Breeding:** Breeds in shallow water collections, such as rainwater puddles and backwaters of streams. **Flight season:** August-November. **Distribution:** Throughout the Oriental region.



Photo:K.A.Subramanian

Blue Bush Darts mating



Scan:K.A.Subramanian

Blue Bush Dart - male

45. Yellow Bush Dart (*Copera marginipes*)

Size: **Male:** Abdomen: 28-31mm, Hindwing: 16-18mm. **Female:** Abdomen: 29-30mm, Hindwing: 20mm.

Description: A black band extend from eye to eye. **Male:**

Eyes: Black above, greenish on sides and beneath with black equatorial band.

Thorax: Bronze black with fine yellow lines on sides. The stripe on sides is narrow and pale greenish yellow. **Legs:**

Bright yellowish orange.

Wings: Transparent. **Wing spot:** Brown. **Abdomen:**

Bronzed black above. Segment 3-6 with a pale stripe along the side and a narrow pale greenish white ring at the end of each segment. **Female:**

Ground colour is dark and of varying shades of brown.

Eyes: Similar to the male but has a brown cap. **Thorax:**

Ground colour is brown. The black stripe above is similar to that of males and black stripe on sides is irregular. **Legs:**

Brownish. **Wings:** Transparent. **Wing spot:** Pale brown. **Abdomen:** Brown above with broad rings towards the end. Half of 8th segment and the whole of 9-10th segments pale brownish white. **Habitat:** Found along ponds, puddles, canals and streams. Flies very close to the ground (<1m). **Breeding:** Breeds in shallow water collections, such as rainwater puddles and backwaters of streams. **Flight season:** August-November. **Distribution:** Oriental region.



Yellow Bush Dart - male



Yellow Bush Dart - female



Yellow Bush Dart - male

Photo:K.A.Subramanian

Photo:K.A.Subramanian

Scan:K.A.Subramanian

REEDTAILS (FAMILY: PLATYSTICTIDAE)

Reedtails are small black or brown damselflies marked with white, blue or, rarely, iridescent markings.

Transparent wings are slightly pointed at the tip.

Abdomen is very long and twice or more than twice the length of the hindwing.

Reed Tails are found in tropical Old and New World. 142 species are known world wide. Within Indian region 13 species are known, of which 8 are found in the Western Ghats. Reed Tails are exclusively found in forested streams and they breed in them.



Pied Reed Tail - female

Photo: E. Kunhikrishnan

46. Pied Reedtail (*Protosticta gravelyi*)

Size: **Male:** Abdomen: 46-49mm, Hindwing: 20-22mm. **Female:** Abdomen: 33-35mm, Hindwing: 19-23mm

Description:

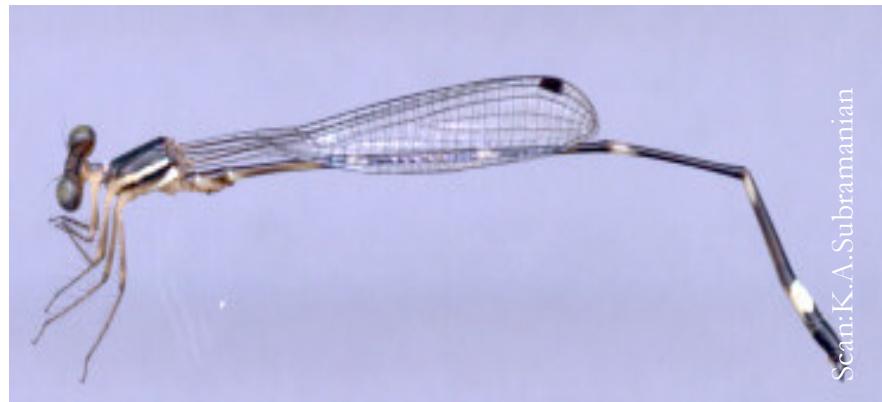
Male: Eyes: Dark bottle green, fading to pale greenish beneath. Thorax: Glossy black, marked with broad diagonal creamy white stripe, extending from middle and hind pair of legs. Legs: Creamy white.

Wings: Transparent.

Wing spot: Black.

Abdomen: Black, marked with creamy white rings at the end of segments 3-7.

The sides of first and



Pied Reed Tail - male



Pied Reed Tail - female

second segment and basal half of 8th segments are turquoise blue. The 9th and 10th segments are unmarked. **Female:** Very similar to male, but abdomen is short.

Eyes: With an ill defined white spot on the outer side. Abdomen: Turquoise blue marking on segment 8 of male is replaced by white spot. **Habits and Habitat:**

Occurs in heavily shaded hill streams. Found among rocks and ferns in streams. It flies in short jerks holding the abdomen rigid and horizontal. In dark forest understorey, the species appears like a chain of darting white dots. **Breeding:** Heavily shaded hill streams. **Flight season:** May-June and again in September-October. **Distribution:** Endemic to the Western Ghats. Does not occur north of Sharavathi Valley.

BAMBOOTAILS (FAMILY: PROTONEURIDAE)

Bambootails are small to medium sized slender damselflies. They are usually black coloured and marked with blue, red, yellow or rarely iridescent. Wings are transparent and rounded or pointed at the tip. Abdomen is long and never twice the length of the hindwing. Bamboo Tails are highly diverse family with 244 known species. Within Indian limits 24 species are known of which 15 are found in peninsular India. All the species breed in running waters and they are restricted to forested landscapes.



Photo:K.A.Subramanian

Nilgiri Bambootail



Photo:K.A.Subramanian

Head and thorax of Nilgiri Bambootail

47. Black Bambootail (*Prodasineura verticalis*)

Size: **Male:** Abdomen: 29mm, Hindwing: 19mm. **Female:** Abdomen: 30mm, Hindwing: 20mm.

Description: A medium sized black damselfly with blood red thoracic stripes.

Male: Eyes:

Velvety black on upper side coral red below. Thorax:

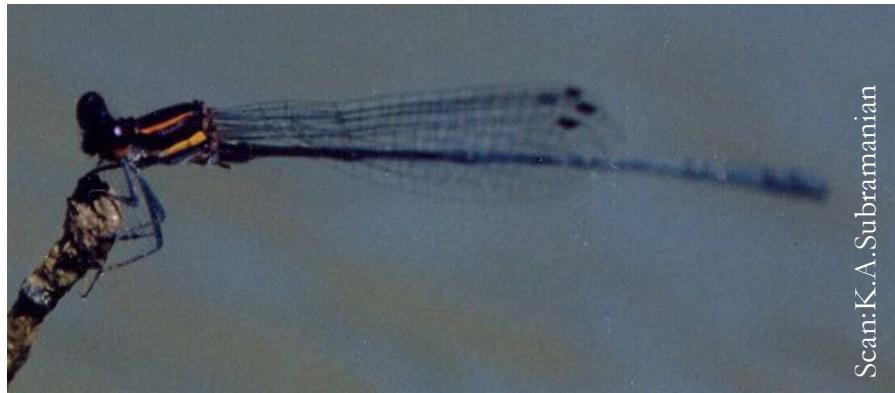
Velvety black with two diagonal brick red stripes on sides. Under side yellowish. Legs:

Black. Wings:

Transparent. Wing

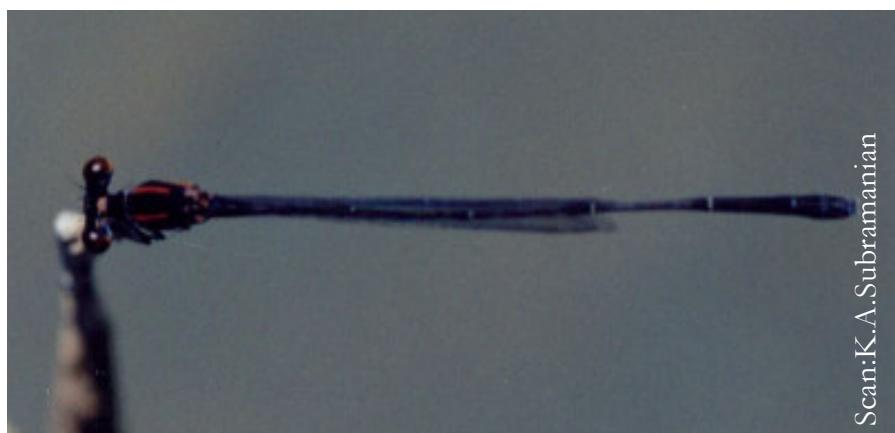
spot: Dark reddish brown. Abdomen:

Black with yellow basal spots from segments 3-7. The first segment has a small spot on each side and the second segment has a narrow yellow border below.



Scan:K.A.Subramanian

Black Bamboo Tail



Scan:K.A.Subramanian

Black Bamboo Tail dorsal view



Scan:K.A.Subramanian

Black Bamboo Tail

Female: Similar to the male and the bright red markings of male are largely replaced by pale yellowish white. **Habits and Habitat:** Found along the banks of large ponds and rivers, usually sitting among emergent water plants. **Breeding:** Not known. **Flight season:** August-December. **Distribution:** Western Ghats, Northeast India extending to Southeast Asia.

48. Black-winged Bambootail (*Disparoneura quadrimaculata*)

Size: **Male:** Abdomen: 32mm, Hind wing: 22mm. **Female:** Abdomen: 29-30mm, Hind wing: 22mm.

Description: A medium sized brick red damselfly with black banded wing.

Male: **Eyes:** Brick red with two equatorial black stripes. **Thorax:**

Bright brick red above, paler on sides. A black narrow stripe above and incomplete or broken stripes are present on sides.

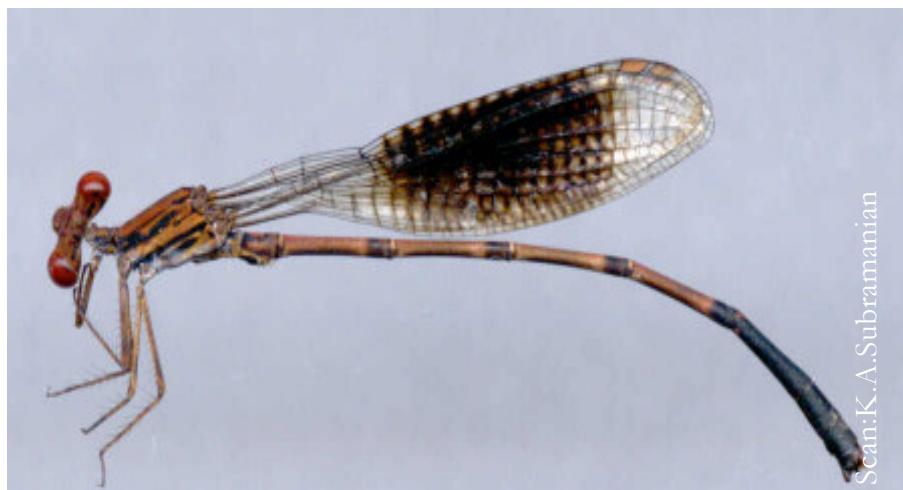
Legs: Pale brown, Femora, Speckled with black. **Wings:**

Transparent with



Photo:K.A.Subramanian

Black-winged Bamboo Tail



Scan:K.A.Subramanian

Black-winged Bamboo Tail

broad blackish brown bands in the centre. **Wing spot:** Rusty brown. **Abdomen:** Brick red. The first segment is black above and the second segment has a large black ring above. The base of segments 3-6 has a pair of small whitish spots above. A narrow pale stripe on each side and a broad black ring towards the end is present. The segments 7-9 is black and the 10th segment is reddish. **Female:** Differ drastically from male. **Thorax:** The thorax is black above. The side is olivaceous green shaded with ochrous and black as in the male. **Legs:** Pale reddish brown. **Wings:** Transparent and without broad brownish black bands. Occasionally edges of the wings are smoky brown. **Abdomen:** Pale olivaceous with rusty brown above, which is marked and shaded with black and brown. **Habits and Habitat:** Streams and rivers. Perches on emergent boulders and aquatic plants. **Breeding:** Not known. **Flight season:** August-December. **Distribution:** Western Ghats, Bihar, West Bengal, Delhi and Rajasthan.

49. Nilgiri Bambootail (*Esme longistyla*)

Size: **Male:** Abdomen: 44mm, Hindwing: 28-29mm. **Female:** Abdomen: 42-43mm, Hindwing: 28mm.

Description: A large blue damselfly with black thoracic stripes. **Male:** Eyes: Sky blue, capped with black.

Thorax: Black above with narrow blue stripes. Azure blue on sides with a diagonal black stripe. Under side is greenish yellow or blue. **Legs:** Black. **Wings:** Transparent. **Wing spot:** Black and rhomboidal in shape. **Abdomen:** Long and slender. The first and segments 8-10 azure blue. The second segment is black with broad irregular azure blue stripe on sides.

The segments 3-7 is black with azure blue rings at the end of each segment. **Female:** Very similar to male.

Habits and Habitat: Shaded forest streams. Perches on overhanging vegetation.

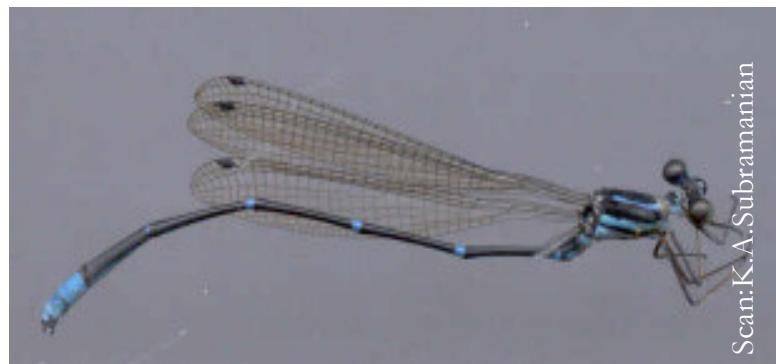
Breeding: Breeds in forest streams. **Flight season:** May-November.

Distribution: Endemic to Western Ghats from north of the Palghat gap to South Kannada.



Photo:E.Kunhikrishnan

Nilgiri Bamboo Tail



Scan:K.A.Subramanian

Nilgiri Bamboo Tail

50. Myristica Bambootail (*Phylloneura westermanni*)

Size: **Male:** Abdomen: 41-51mm, Hindwing: 28-37mm. **Female:** Abdomen: 45-46mm, Hindwing: 33-35mm

Description: **Male:** **Eyes:** Deep blue capped with black. **Thorax:** Black above marked with narrow black stripe, blue on sides with diagonal black stripe. **Legs:** Black. **Wings:** Transparent and smoky. Double cells between main nervures are very characteristic. **Wing spot:** Black or dark reddish brown. **Abdomen:** Black with blue markings. The first segment is broadly blue on sides and second segment has blue broader on underside. The segments 3-5 has narrow blue basal rings. The apical half of 7th segment is azure blue. The 8th and 9th segments are entirely azure blue.

Female: Very similar to the male, however, the 8th and 9th abdominal segments have large triangular blue spots above. **Habits and Habitat:**

Shaded mountain streams and associated *Myristica* (Nutmeg) swamps. Perches on overhanging plants. When disturbed, flies higher in to the trees. **Breeding:** Streams and *Myristica* swamps. **Flight season:** August-November.

Distribution: This rare damselfly is endemic to the Western Ghats between the Nilgiris and Sharavathi Valley.



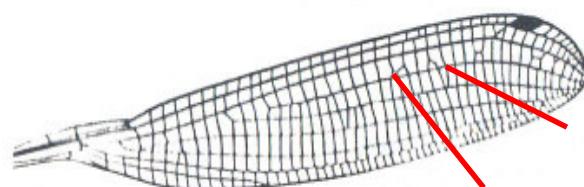
Photo:K.A.Subramanian

Myristica Bamboo Tail



Scan:K.A.Subramanian

Myristica Bamboo Tail



Wing of Myristica Bamboo Tail showing double cell

SPREADWINGS (FAMILY: LESTIDAE)

Spreadwings are small to medium sized damselflies with iridescent or non-iridescent markings on head, thorax and abdomen. Spreadwings rest with their wings wide open. The abdomen is long and slender. Spreadwings are found throughout the world and 159 species are known. Indian fauna is represented by 25 species of which 8 are recorded from peninsular India. Spreadwings breed in a variety of aquatic habitats like marshes, ponds and rarely in running waters.



Photo:K.A.Subramanian

Emerald Spreadwing



Photo: Natasha Mahatre

Head of Emerald Spreadwing

51. Emerald Spreadwing (*Lestes elatus*)

Size: **Male:** *Abdomen:* 34-36mm, *Hindwing:* 23-24mm. **Female:** *Abdomen:* 34mm, *Hindwing:* 24mm.

Description: A medium sized brown damselfly with narrow iridescent green thoracic stripes. **Male:**

Eyes: Brown above, torquise blue below.

Thorax: Dark brown above, fading to white below. Upper side marked with a pair of narrow iridescent green stripes.

Legs: Pale greenish brown. **Wings:**

Transparent. **Wing spot:**

Black. **Abdomen:** Pale bluish green on sides. Upper side is iridescent green or bronze, changing to dull black on terminal segments. **Female:** Similar

to male, but the ground colour is pale brown and markings are less iridescent. **Habits and Habitat:** Common around tanks, ponds and streams. Usually sits with open wings among plants. Though a weak flier, it is very alert and difficult to approach.

Breeding: Breed in ponds, canals and tanks. **Flight season:** Throughout the year, however very abundant during September-December months in grasslands.

Distribution: Peninsular India and Sri Lanka.



Photo: Natasha Mahatre

Emerald Spread Wing



Scan:K.A.Subramanian

Emerald Spread Wing

52. Malabar Spreadwing (*Lestes malabarica*)

Size: **Male:** Abdomen: 24-25mm, Hindwing: 21mm. **Female:** Abdomen: 32-33mm, Hindwing: 22-23mm.

Description: A small brown damselfly with broad iridescent green thoracic stripes. **Male:**

Eyes: Torquoise blue, paler beneath. **Thorax:** Bright iridescent green above. Sides of the thorax black. A dark brown stripe is present medially and on sides. Underside is black covered by pruinescence. **Legs:**

Yellowish with a parallel pair of black stripes on outer sides of femora. **Wings:** Transparent and smoky. **Wing spot:** Black.

Abdomen: Sides azure blue, dull iridescent green above. The segments 3-6 have a narrow basal ring of blue and pale yellow ring. Remaining terminal segments are black.

Female: Very similar to male,

however the ground colour more greenish. The sides of the thorax brown with five black spots. The abdomen is dull coppery above upto segment 6, then dull black.

The 6th segment partially, the sides of 9th and entire 10th segment is yellow. **Habits and Habitat:** Makes short flight among bushes. Rarely flies above 1m. Perches on dry twigs with open wings, and slowly wagging its tail. **Breeding:** Tanks and ponds. **Flight season:** May-June. **Distribution:** Western Ghats, Andaman Islands and Chandigarh. Coinciding with south west monsoon there appears to be local migration which is not clearly known.



Malabar Spread Wing - male

Scan:K.A.Subramanian



Malabar Spread Wing - female

Scan:K.A.Subramanian

GLORIES (FAMILY: CALOPTERYGIDAE)

Glories are large damselflies with broad head and conspicuous round eyes. These iridescent coloured damselflies have broad rounded hindwing. Wings are transparent, amber or iridescent coloured. Abdomen is longer than the hindwing. Glories are found in temperate and tropical regions. Worldwide 169 species are known. Within Indian limits 10 species are known of which 3 species are found in peninsular India. Glories are associated with forested streams and they breed in them.



Male Stream Glory flashing its wings



Head and thorax of Forest Glory

53. Stream Glory (*Neurobasis chinensis*)

Size: **Male:** Abdomen: 45-50mm, Hind wing: 32-38mm. **Female:** Abdomen: 44-50mm, Hind wing: 36-40mm.

Description: **Male:** **Eyes:**

Blackish brown above, bluish white below. **Thorax:** Iridescent green with a coppery wash.

Legs: Long and lanky legs are dark bronze with white outer stripe. **Wings:** Rounded at tips. Forewings transparent, tinted with pale yellowish green with emerald green venation. Hindwings opaque, basal two thirds iridescent green or peacock blue. Apical half is blackish brown with violet reflections and green iridescent veins. Underside of hindwing uniformly blackish brown with dull golden reflections. **Wing spot:**

Absent in all wings. **Abdomen:** Iridescent green above and on sides, Underside black. The 9th and 10th segments are whitish. **Female:** **Eyes:** Brownish above, yellowish white below. **Thorax:** Similar to males. **Legs:** Similar to males. **Wings:**

Transparent and amber coloured. All wings have a round creamy white central opaque spot on the edge of the wing. **Wing spot:** Absent in forewings and creamy white in hindwings. **Abdomen:** Dull iridescent green above and black below. Green metallic stripe on sides in all segments bordered with black. **Habits and Habitat:**

Common in hill streams upto an altitude of 2250m. Commonly found between 500-1200m. Perches on emergent boulders and fallen logs in streams. Males flash its iridescent green marking of hind wing immediately after alighting. **Breeding:** Female lays eggs on submerged decaying logs in streams during south west monsoon.

Flight season: May to November. **Distribution:** Throughout forested landscapes of Oriental region.



Photo: E.Kunhikrishnan

Stream Glory - male



Photo: E.Kunhikrishnan

Stream Glory - female

54. Clear-winged Forest Glory (*Vestalis gracilis*)

Size: **Male:** Abdomen: 45-46mm, Hindwing: 34-38mm. **Female:** Abdomen: 43-50mm, Hindwing: 36-39mm

Description: A large iridescent green damselfly with transparent wings. **Male:**

Eyes: Dark brown above, greenish yellow below.

Thorax: Iridescent emerald green above, yellowish beneath. **Legs:** Pale to dark brown. **Wings:** transparent with a blue sheen.

Wingspot: Absent.

Abdomen: Iridescent green or blue above and black beneath. **Female:**

Resembles males in colour and markings. However, the abdomen is dull iridescent green. **Habits and Habitat:** Commonly found along hill streams. Large numbers usually rest among bushes in forest paths in association with Black-tipped Forest Glory. **Breeding:** In forest streams. **Flight season:** May to November.

Distribution: Throughout Oriental region.



Photo: John Moore

Clear-winged Forest Glory

55. Black-tipped Forest Glory (*Vestalis apicalis*)

Size: **Male:** Abdomen: 49-55mm, Hindwing: 36-39mm. **Female:** Abdomen: 46-50mm, Hindwing: 38-40mm.

Description: Male:

Eyes: Blackish brown above, yellowish white below. **Thorax:**

Metallic green above and on sides. The underside is yellowish white.

Legs: Blackish brown. **Wings:** transparent with

amber tint and blue sheen. Wing tips blackish brown. **Wingspot:** Absent

Abdomen: Iridescent green or blue, black underneath. **Female:** Resembles the male. The black markings on wing tips are paler and less sharply defined.

Abdomen is less iridescent green and more coppery. **Habits and Habitat:** Commonly found along hill streams. Large numbers usually rest among bushes in forest paths in association with Clear-winged Forest Glory. **Breeding:** Breeds in forest streams. **Flight season:** May to November. **Distribution:** Forested areas of Oriental region.



Photo:E.Kunhikrishnan

Black-tipped Forest Glory

STREAM JEWELS (FAMILY: CHLOROCYPHIDAE)

Stream Jewels are small damselflies with large bulb like eyes and a protruding face. Thorax is short and stout. The wings are transparent, iridescent in males and transparent in females. Abdomen is cylindrical and shorter than the hindwing. Stream Jewels are restricted the Old World with 158 known species. Indian fauna is represented by 20 species, of which 3 are found in peninsular India. Stream Jewels are associated with forested streams and they breed in them.



River Heliodor - female



Freshly emerged River Heliodor

56. Stream Ruby (*Rhinocypha bisignata*)

Size: **Male:** Abdomen: 20mm, Hindwing: 24-26mm. **Female:** Abdomen: 16mm, Hindwing: 22mm

Description: A small black and red damselfly with red iridescent streaks on wings. **Male:** **Eyes:** Blackish brown. **Thorax:** Black thorax with two triangular orange-red spots. On sides, it has a narrow rusty stripe and below that another broken rusty stripe is also present. **Legs:** Black with white outer surface. **Wings:** Transparent and amber tinted. Forewings are tipped black with brilliant coppery sheen. Hindwings black tipped with two series of elongated brilliant iridescence.

Wing spot: Black. **Abdomen:** Black, marked with yellow from segments 1-5. **Female:** **Eyes:** Brownish black above, bluish grey below. **Thorax:** Similar to male but orange red and rusty stripes more yellowish. **Legs:** Black with creamy white centres. **Wings:** Transparent, tinted with yellow. **Wing spot:** Black. **Abdomen:** Similar to male but dull coloured. **Habitat:** Very common in hill streams. Males are very conspicuous and hover over streams. Frequently sit on boulders and twigs. Females are more elusive. **Breeding:** Breeds in hill streams. **Flight season:** Throughout the year. **Distribution:** Hills of peninsular India.



Stream Ruby



Stream Ruby

Photo:V.V.Sivan

Photo:E.Kunhikrishnan

57. River Heliodor (*Libellago lineata*)

Size: **Male:** Abdomen: 14-16mm, Hindwing: 15-18mm. **Female:** Abdomen: 13-17mm, Hindwing: 17-20mm

Description: A small black and yellow damselfly with black tipped transparent wing. **Male:**

Eyes: Dark brown above and grey below. **Thorax:** Black with yellow stripes above and on sides. **Legs:** Black with white outer surface. **Wings:** Transparent and amber tinted at the base. The tips of the forewings black. Hindwings shorter than fore wing.

Wingspot: Absent in forewings, black in hind wings. **Abdomen:** Golden yellow with black dumb bell shaped markings above. The segments 8-10 are black.

Female: **Eyes:** Brown above grey below. **Thorax:** Similar to male and markings more extensive and dull. **Legs:** Yellow, femora lined extensively with brown. **Wings:** Transparent with amber tint. **Wing spot:** Creamy white. Present in all wings. **Abdomen:** Yellow, with black markings. The first segment has a large square spot above. The segments 2-8 has a broad black patch above. This is bisected by a narrow yellow line, which extend to the 9th segment and the last segment is black. **Habitat:** Confined to hill streams and rivers of forested landscapes. Frequently sits in emergent water plants and overhanging bushes. **Breeding:** Breed in hill streams. **Flight season:** Throughout the year. **Distribution:** Oriental region.



Photo:K.A.Subramanian

River Heliodor - male



Photo:K.A.Subramanian

River Heliodor - female

TORRENT DARTS (FAMILY: EUPHAEIDAE)

Torrent Darts are large damselflies with large round eyes. The wings are transparent, tinted or with iridescent markings. Forewings are long and narrow and hindwings broad and rounded. The hindwings are shorter than the forewings and abdomen.

The abdomen is longer than the hindwings in males and shorter or of the same length in the females. Species of this family are found predominantly in the Oriental region. Worldwide 65 species are known. Within Indian limits, 19 species are recorded, of which 4 are found in peninsular India.



Malabar Torrent Dart

Photo:K.A.Subramanian

58. Nilgiri Torrent Dart (*Euphaea dispar*)

Size: **Male:** Abdomen: 39-47mm, Hind wing: 32-40mm, Fore wing: 35-42mm.

Female: Abdomen: 35-38mm, Hind wing: 34-39mm

Description: Male:

Eyes: Black above, bluish grey below.

Thorax: Black, marked with bright orange red. Orange stripes on sides fused in front and behind to enclose a long oval black spot.

Legs: Bright yellow, outer surface of tibia and femora are reddish. **Wings:**

Transparent, smoky light brown tips of forewings tipped with blackish brown. Tips of hindwing broadly black.



Nilgiri Torrent Dart - male



Nilgiri Torrent Dart - female

Though the tip appears black it is iridescent red on upper side and blue on lower side.

Wing spot: Black. **Abdomen:** Bright orange red. Segment joints and apical end of segment 6 to the end black. **Female:** **Thorax:** Markings similar to males. However the bright orange red of male is replaced by dull yellow. **Legs:** Similar to male, but more blackish. **Wings:**

Transparent and uniformly covered with brown. In old individuals the hindwing tip is brownish black.

Wing spot: Black. **Abdomen:** Black, marked with bright yellow. The first segment is yellow, and segments 2-7 have longitudinal yellow stripes on either sides. The 8th and 9th segment is marked with black square spots on sides. The last segment is unmarked.

Habits and Habitat: Found in streams flowing through evergreen forests. Males perch on boulders and dry twigs near streams. They fly up to riparian trees when disturbed. Males prominently display their copper red markings of forewings immediately after alighting.

Breeding: Streams flowing through evergreen forest. **Flight season:** May-November.

Distribution: Endemic to Western Ghats between Nilgiris and Udupi districts.

59. Malabar Torrent Dart (*Euphaea fraseri*)

Size: **Male:** Abdomen: 36-41mm, Hind wing: 29-35mm, Fore wing: 34-38mm.

Female: Abdomen: 33-34mm, Hind wing: 31-33mm.

Description: **Male:** **Eyes:** Dark brown above, pale brown below.

Thorax: Black with azure blue stripe above. The two stripes on sides are rusty and encloses an oval black spot. Underside is rusty.

Legs: Coral red. **Wings:** Transparent. Hindwings are markedly shorter than the forewings. Forewings are tipped with brown. Hindwings are broadly tipped with iridescent coppery above and blue below. **Wing spot:**

Black. **Abdomen:** Upto segment 6 coral red. The 7th segment has black tip and remaining terminal segments are black. **Female:**

Similar to male, however the azure

blue and red area of thorax and abdomen are replaced by dull yellow. **Eyes:** Dark brown above and bluish grey below. **Legs:** Greyish yellow. **Wings:** Transparent and covered with blackish brown. Hindwing without iridescent apices of males. **Wing spot:** Black. **Abdomen:**

The segments 1-7 is black above and it is yellow on sides and below, with a black longitudinal stripe. The terminal segments are black with a yellow spot on segment 10. **Habits and Habitat:** Common in hill streams from about 90m-1000m. Males are very common and can be seen using same perch for days together. Females are rarer. Males open wings and prominently display the iridescent copper markings of the upperhind wing. **Breeding:**

Breeds in hill streams and larvae can be collected throughout the year. **Flight season:**

May to December. **Distribution:** Earlier thought to be endemic to the Western Ghats from Agastyamalai to Dakshin Kannada. But the author has recorded this species from the Eastern Ghats (Thalakonan falls of Thirupathi Hills and Nagarjunasagar Wildlife Sanctuary) also.



Photo:E.Kunhikrishnan

Male Malabar Torrent Dart



Photo:K.A.Subramanian

Male and Female Malabar Torrent Dart

60. Black Torrent Dart (*Dysphaea ethela*)

Size: Male: *Abdomen*: 38mm, *Hindwing*: 33mm. Female: *Abdomen*: 32mm, *Hindwing*: 33mm.

Description: A large black damselfly with amber coloured wings.

Male: Eyes: Black above, pale bluish grey below. Thorax: Velvety black. Legs:

Black. Wings: Transparent and amber coloured.

Wingspot: Long and black. Abdomen: Black with very faint yellow rings at the end of segments.

Female: Eyes: Dark olivaceous brown above, bluish grey beneath. Thorax: Black, marked with bright yellow. Two yellow stripes on sides enclose a black area. Three yellow stripes on sides separated by black area.

Legs: Black, with yellow marks within. Wings: Transparent and covered with amber colour. Wingspot: Long black. Abdomen: Black with more pronounced yellow markings. **Habits and Habitat:**

Torrential hill streams from 300-1000m ASL. This damselfly is rare and usually sits in the middle of streams on boulders or emergent twigs. If disturbed flies high up to riparian trees. **Breeding:** Not known. **Flight season:** June to December. **Distribution:** Western Ghats from Agastyamalai to Aghanashini river in Uttara Kannara district. This species is also known from the Eastern Ghats.



Photo: E.Kumhikrishnan

Black Torrent Dart

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GLOSSARY OF TERMS

Biotope: Refers to habitat in broad sense. See habitat

Clutch: Complement of oocytes that mature together to produce a batch of eggs, which are usually laid together.

Conspecific: Belonging to the same species.

Courtship: A set of behavioural interactions between male and female that facilitates copulations; usually refers to displays by males.

Crepuscular: Active during twilight hours.

Dimorphism: Occurrence of two forms of individuals of a species.

Dispersal: Spatial displacement of individuals, that causes them to become further apart.

Diurnal: Active during day.

Ecosystem: Natural unit consisting of interacting living and non living parts.

Eclosion: See emergence.

Ectoparasite: Parasite living on the host. Also parasite and parasitoid.

Emergence: Events associated with emergence of adult from larva.

Endemic: Restricted to a particular geographic area.

Feeding: Behaviour that follows prey capture.

Flight season: Period of the year during which reproductively mature adults are active.

Foliate: Leaf like.

Foraging: Behaviour that increases the likelihood of prey capture.

Guarding: Behaviour of male when escorting a female and usually while she is ovipositing.

Habitat: Place where a given species or community lives.

Hyaline: Transparent, colourless.

Instar: Stage of larva between two successive moults.

Larva: Development stage between egg and adult.

Microhabitat: Specific part of a habitat in which an individual is normally found during a specific stage of its life cycle or when performing a particular activity.

Migration: Spatial displacement of population from emergence site to a different habitat where reproduction ensues. Migration may be facultative or obligate and migrating individuals may or may not travel in aggregations.

Monotypic: Genus with only one species.

Myristica swamps: Patches of evergreen swamp forests dominated by species of nutmeg family (Myristicaceae).

Nocturnal: During night.

Obelisk posture: Position adopted by perching dragonflies with abdomen pointing vertically upward, usually when the sun is overhead.

Ovipositor: Extension of female genetalia involved in oviposition.

Oviposition: Act of laying eggs.

Parasitism: Interaction between species in which one species-the parasite- lives in or on the other species-the host-from which it is benefited; the host is not necessarily killed by the interaction.

Parasitoid: Larvae of insects which parasite other insects and kill host.

Pruinescence: Bloom on body surface, more often in males, caused by supracuticular pigment that reflects ultraviolet light.

Riparian: Along the bank of a river or lake.

Site fidelity: Duration of site residentiality.

Tandem linkage: Physical connection between male and female before copulation formed by male holding female by prothorax or head with his anal appendages.

Wetland: Ecosystems of fresh or brackish water with distinct set of plant and animal community. Ecosystems such as puddles, pools, ponds, tanks, lakes, reservoirs, canals, streams, rivers, marshes, paddy fields and estuaries are wetlands.

Wheel position: Copulation.

CHECKLIST OF PENINSULAR INDIAN DRAGONFLIES AND DAMSELFLIES

Damselflies (Zygoptera)

SI NO:	Family	Name as in Fraser, 1933-36	Name as in Prasad & Varshney, 1996
I	Coenagrionidae		
1		<i>Aciagrion hisopa</i>	<i>Aciagrion hisopa</i> (Selys, 1876)
2		<i>Aciagrion occidentale</i>	<i>Aciagrion occidentale</i> Laidlaw, 1919
3		<i>Aciagrion pallidum</i>	<i>Aciagrion pallidum</i> Selys, 1891
4			<i>Agriocnemis keralensis</i> Peters, 1981
5			<i>Agriocnemis lacteola</i> Selys, 1877
6		<i>Agriocnemis pieris</i>	<i>Agriocnemis pieris</i> Laidlaw, 1919
7		<i>Agriocnemis pygmea</i>	<i>Agriocnemis pygmea</i> (Rambur, 1842)
8		<i>Agriocnemis splendissima</i>	<i>Agriocnemis splendissima</i> Laidlaw, 1919
9		<i>Archibasis mimetes</i>	<i>Archibasis oscillans</i> (Selys, 1877)
10		<i>Coenagrion dyeri</i>	<i>Cercion calamorum</i> (Ris, 1916)
11		<i>Ceriagrion cerinorubellum</i>	<i>Ceriagrion cerinorubellum</i> (Brauer, 1865)
12		<i>Ceriagrion coromandelianum</i>	<i>Ceriagrion coromandelianum</i> (Fabr., 1798)
13		<i>Ceriagrion olivaceum</i>	<i>Ceriagrion olivaceum</i> Laidlaw, 1914
14			<i>Ceriagrion rubiae</i> Laidlaw, 1916
15			<i>Enallagma parvum</i> Selys, 1876
16		<i>Ischnura delicata</i>	<i>Ischnura aurora</i> (Brauer, 1865)
17		<i>Ischnura senegalensis</i>	<i>Ischnura senegalensis</i> (Ramb., 1842)
18		<i>Mortonagrion varralli</i>	<i>Mortonagrion varralli</i> Fraser, 1920
19		<i>Onychargia atrocyana</i>	<i>Onychargia atrocyana</i> Selys, 1877
20		<i>Pseudagrion decorum</i>	<i>Pseudagrion decorum</i> (Rambur, 1842)
21			<i>Pseudagrion hypermelas</i> Selys, 1876
22		<i>Pseudagrion indicum</i>	<i>Pseudagrion indicum</i> Fraser, 1924
23		<i>Pseudagrion malabaricum</i>	<i>Pseudagrion malabaricum</i> Fraser, 1924
24		<i>Pseudagrion microcephalum</i>	<i>Pseudagrion microcephalum</i>
(Rambur, 1842)			
25		<i>Pseudagrion rubriceps</i>	<i>Pseudagrion rubriceps</i> Selys, 1876
II	Platycenemididae		
26		<i>Copera marginipes</i>	<i>Copera marginipes</i> (Ramb., 1842)
27		<i>Copera vittata</i>	<i>Copera vittata</i> Laidlaw, 1917
III	Platystictidae		
28		<i>Platysticta deccanensis</i>	<i>Platysticta maculata</i> Laidlaw, 1915
29		<i>Protosticta antelopoides</i>	<i>Protosticta antelopoides</i> Fraser, 1931
30		<i>Protosticta devanporti</i>	<i>Protosticta devanporti</i> Fraser, 1931
31		<i>Protosticta gravelyi</i>	<i>Protosticta gravelyi</i> Laidlaw, 1915
32		<i>Protosticta hearseyi</i>	<i>Protosticta hearseyi</i> Fraser, 1922
33		<i>Protosticta mortoni</i>	<i>Protosticta mortoni</i> Fraser, 1924
34		<i>Protosticta rufostigma</i>	<i>Protosticta rufostigma</i> Kimmins, 1958
35		<i>Protosticta sanguinostigma</i>	<i>Protosticta sanguinostigma</i> Fraser, 1922
IV	Protoneuridae		
36			<i>Caconeura gomphoides</i> (Ramb., 1842)
37		<i>Caconeura verticalis</i>	<i>Prodasineura verticalis</i> (Fraser, 1921)
38		<i>Chloroneura apicalis</i>	<i>Disparoneura apicalis</i> (Fraser, 1924)
39		<i>Chloroneura quadrimaculata</i>	<i>Disparoneura quadrimaculata</i> (Ramb., 1842)
40		<i>Disparoneura canningi</i>	<i>Disparoneura canningi</i> Fraser, 1922

41	<i>Disparoneura nigerrima</i>	<i>Elattoneura nigerrima</i> Laidlaw,1917
42	<i>Disparoneura souteri</i>	<i>Elattoneura souteri</i> Fraser,1924
43	<i>Disparoneura tetrica</i>	<i>Elattoneura tetrica</i> Laidlaw,1917
44	<i>Esme cyaneovittata</i>	<i>Esme cyaneovittata</i> Fraser,1922
45	<i>Esme longistyla</i>	<i>Esme longistyla</i> Fraser,1931
46	<i>Esme mudiensis</i>	<i>Esme mudiensis</i> Fraser,1931
47	<i>Indoneura ramburi</i>	<i>Cacconeura ramburi</i> Fraser,1933
48	<i>Indoneura risi</i>	<i>Cacconeura risi</i> Fraser,1931
49	<i>Melanoneura bilineata</i>	<i>Melanoneura bilineata</i> Fraser,1931
50	<i>Phylloneura westermanni</i>	<i>Phylloneura westermanni</i> Selys,1860
V	Lestidae	
51	<i>Ceylonolestes davenporti</i>	<i>Indolestes davenporti</i> Fraser, 1930
52	<i>Ceylonolestes pulcherrima</i>	<i>Indolestes pulcherrimus</i> Fraser,1924
53	<i>Lestes dorothea</i>	<i>Lestes dorothea</i> Fraser,1930
54	<i>Lestes elata</i>	<i>Lestes elatus</i> Hagen in Selys,1862
55	<i>Lestes malabarica</i>	<i>Lestes malabarica</i> Fraser,1929
56	<i>Lestes patricia</i>	<i>Lestes patricia</i> Fraser,1924
57	<i>Lestes praemrosa</i>	<i>Lestes praemrosus</i> Kirby,1893
58	<i>Lestes viridula</i>	<i>Lestes viridulus</i> Rambur,1842
VI	Calopterygidae	
59	<i>Neurobasis chinensis</i>	<i>Neurobasis chinensis</i> (Linnaeus,1758)
60	<i>Vestalis apicalis</i>	<i>Vestalis apicalis</i> Selys,1873
61	<i>Vestalis gracilis</i>	<i>Vestalis gracilis</i> (Rambur,1842)
VII	Chlorocyphidae	
62	<i>Calocypha laidlawi</i>	<i>Calocypha laidlawi</i> (Fraser,1924)
63	<i>Libellago lineata</i>	<i>Libellago lineata</i> (Fraser,1928)
64	<i>Rhinocypha bisignata</i>	<i>Rhinocypha bisignata</i> (Selys,1853)
VIII	Euphaeidae	
65	<i>Indophaea cardinalis</i>	<i>Euphaea cardinalis</i> Fraser,1924
66	<i>Indophaea dispar</i>	<i>Euphaea dispar</i> (Ramb.,1842)
67	<i>Indophaea fraseri</i>	<i>Euphaea fraseri</i> (Laidlaw,1920)
68	<i>Dysphaea ethela</i>	<i>Dysphaea ethela</i> Fraser,1924

Dragonflies (Anisoptera)

SINO: Family	Name as in Fraser, 1933-36	Name as in Prasad & Varshney, 1996
IX Gomphidae		
69	<i>Acrogomphus fraseri</i>	<i>Acrogomphus fraseri</i> Laidlaw,1925
79	<i>Gomphus nilgiricus</i>	<i>Asiagomphus nilgiricus</i> (Laidlaw, 1922)
70	<i>Burmagomphus cauvericus</i>	<i>Burmagomphus cauvericus</i> Fraser, 1926
71	<i>Burmagomphus laidlawi</i>	<i>Burmagomphus laidlawi</i> Fraser,1924
72	<i>Burmagomphus pyramidalis</i>	<i>Burmagomphus pyramidalis</i> Fraser,1922
73	<i>Cyclogomphus heterostylus</i>	<i>Cyclogomphus heterostylus</i> Selys,1854
74	<i>Cyclogomphus wilkinsi</i>	<i>Cyclogomphus wilkinsi</i> Fraser,1924
75	<i>Davidioides martini</i>	<i>Davidioides martini</i> Fraser,1924
76	<i>Gomphidia fletcheri</i>	<i>Gomphidia fletcheri</i> Fraser,1923
77	<i>Gomphidia kodaguensis</i>	<i>Gomphidia kodaguensis</i> Fraser,1923
78	<i>Gomphidia T-nigrum</i>	<i>Gomphidia T-nigrum</i> Selys,1854
80	<i>Heliogomphus kalarensis</i>	<i>Heliogomphus kalarensis</i> Fraser,1934
81	<i>Heliogomphus promelas</i>	<i>Heliogomphus promelas</i> (Selys,1873)
82	<i>Ictinus rapax</i>	<i>Ictinogomphus rapax</i> Rambur,1842
86	<i>Macrogomphus annulatus</i>	<i>Macrogomphus annulatus</i> (Selys,1854)
87	<i>Macrogomphus wynaadicus</i>	<i>Macrogomphus wynaadicus</i> (Fraser,1924)
88	<i>Megalogomphus hannyngtoni</i>	<i>Megalogomphus hannyngtoni</i> (Fraser,1923)

89	<i>Megalogomphus superbus</i>	<i>Megalogomphus superbus</i> Fraser,1931
90	<i>Merogomphus longistigma</i>	<i>Merogomphus longistigma</i> (Fraser,1922)
92		<i>Microgomphus chelifer</i> Selys,1858
93	<i>Microgomphus souteri</i>	<i>Microgomphus souteri</i> Fraser,1924
94	<i>Microgomphus torquatus</i>	<i>Microgomphus torquatus</i> (Selys,1854)
83	<i>Lamelligomphus acinaces</i>	<i>Onychogomphus acinaces</i> (Laidlaw,1922)
84	<i>Lamelligomphus malabarensis</i>	<i>Onychogomphus malabarens</i> (Fraser,1924)
85	<i>Lamelligomphus nilgiriensis</i>	<i>Onychogomphus nilgiriensis</i> (Fraser,1934)
95	<i>Onychogomphus striatus</i>	<i>Onychogomphus striatus</i> (Fraser,1924)
91	<i>Mesogomphus lineatus</i>	<i>Paragomphus lineatus</i> (Selys,1850)
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97		<i>Anaciaeschna donaldi</i> (Fraser,1922)
98		<i>Anax guttatus</i> (Burmeister,1839)
99		<i>Anax immaculifrons</i> Rambur,1842
100		<i>Anax parthenope</i> (Selys,1839)
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107		<i>Epophthalmia vittata</i> Burmeister,1839
108		<i>Hemicordulia asiatica</i> Selys,1878
109	<i>Idionyx burliyarensis</i>	<i>Idionyx corona</i> Fraser,1928
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112	<i>Idionyx nadganiensis</i>	<i>Idionyx nadganiensis</i> Fraser,1924
116	<i>Idiophya nilgiriensis</i>	<i>Idionyx nilgiriensis</i> Fraser,1918
117		<i>Idionyx periyashola</i> Fraser,1939
113	<i>Idionyx rhinoceroides</i>	<i>Idionyx rhinoceroides</i> Fraser,1934
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123	<i>Macromia flavoclorata</i>	<i>Macromia flavoclorata</i> Fraser,1935
124	<i>Macromia ida</i>	<i>Macromia ida</i> Fraser,1924
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129		<i>Aethriamanta brevipennis</i> (Rambur,1842)
130		<i>Bachydiplax sobrina</i> (Rambur,1842)
131		<i>Brachythemis contaminata</i> (Fabr.,1793)
132		<i>Bradinopyga geminata</i> (Rambur,1842)
133		<i>Cratilla lineata</i> Foerster,1903
134		<i>Crocothemis servilia</i> (Drury,1770)

135	<i>Diplacodes lefebvrei</i>	<i>Diplacodes lefebvrei</i> (Rambur,1842)
136	<i>Diplacodes nebulosa</i>	<i>Diplacodes nebulosa</i> (Fabricius,1793)
137	<i>Diplacodes trivialis</i>	<i>Diplacodes trivialis</i> (Rambur,1842)
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141	<i>Indothemis caesia</i>	<i>Indothemis carnatica</i> (Fabr.,1798)
142	<i>Indothemis limbata</i>	<i>Indothemis limbata</i> Campion,1923
143	<i>Lathrecista asiatica</i>	<i>Lathrecista asiatica</i> (Fabr.,1798)
144	<i>Macrodiplax cora</i>	<i>Macrodiplax cora</i> (Brauer,1867)
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147	<i>Neurothemis tullia</i>	<i>Neurothemis tullia</i> (Drury,1773)
148	<i>Onychothemis testacea</i>	<i>Onychothemis testacea</i> Ris,1912
149	<i>Orthetrum chrysostigma</i>	<i>Orthetrum chrysostigma</i> (Selys,1892)
150	<i>Orthetrum glaucum</i>	<i>Orthetrum glaucum</i> (Brauer,1865)
151	<i>Orthetrum pruinosum</i>	<i>Orthetrum pruinosum</i> (Rambur,1842)
152	<i>Orthetrum sabina</i>	<i>Orthetrum sabina</i> (Drury,1770)
153	<i>Orthetrum triangulare</i>	<i>Orthetrum triangulare</i> (Selys,1878)
154	<i>Palpopleura sexmaculata</i>	<i>Palpopleura sexmaculata</i> (Fabr.,1787)
155	<i>Pantala flavescens</i>	<i>Pantala flavescens</i> (Fabr.,1798)
156	<i>Potamaracha obscura</i>	<i>Potamaracha congener</i> (Rambur,1842)
157	<i>Rhodothemis rufa</i>	<i>Rhodothemis rufa</i> (Rambur,1842)
158	<i>Rhyothemis triangularis</i>	<i>Rhyothemis triangularis</i> Kirby,1889
159	<i>Rhyothemis variegata</i>	<i>Rhyothemis variegata</i> Linn.,1763
160	<i>Sympetrum fonscolombi</i>	<i>Sympetrum fonscolombi</i> (Selys,1840)
161		<i>Sympetrum hypomelas</i> (Selys,1844)
162		<i>Tetrathemis platyptera</i> Selys,1878
163		<i>Tholymis tillarga</i> (Fabr.,1798)
164		<i>Tramea basilaris</i> Kirby,1889
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177		<i>Zyxomma petiolatum</i> Rambur,1842

Note: 1.Species in bold are endemic to peninsular India.

2.Family and species level classification follows:

1. Davies, D.A.L and Tobin, P. (1984, 1985). The dragonflies of the world: A systematic list of the extant species of Odonata. Vol. I&II. *Soc. Internat. Odonatol. Rapid Comm. (Suppl.)*, Nos.3&5. Pages 1-127&1-151.

2. Prasad, M and Varshney, R.K (1995). A checklist of the Odonata of India including data on larval studies. *Oriental Insects*, 29:385-428.

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Dragonflies and Damselflies of India-A Field Guide



- The first photographic field guide to 60 peninsular Indian dragonflies and damselflies.
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DRAGONFLIES (ANISOPTERA)



Photo:Praveen



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Clubtails(Gomphidae) Page-37



Photo:Krushnamegh Kunte

Darners(Aeshnidae) Page-40



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Mountain Hawks (Corduligasteridae) Page-46



Photo:Srinidhi

Skimmers(Libellulidae) Page-48

CLUBTAILS (FAMILY:GOMPHIDAE)

ClubTails are large or medium sized dragonflies. They are generally black or yellow and marked with yellow or green. The eyes are well separated and large. The wings are transparent. The last abdominal segments of many species are bulbous, giving a club shaped appearance. Clubtails are very diverse family with 919 species distributed throughout the world. Indian fauna is represented by 90 species with 27 peninsular Indian species. Clubtails inhabit diverse aquatic habitats and many of them breed in streams and rivers.



Common Club Tail feeding on a fly
Head of Common ClubTail

1. Syrandiri Clubtail (*Davidioides martini*)

Size: **Male:** Abdomen: 38mm. Hind wing: 33mm

Description: A medium sized black and yellow dragonfly with out a clubtail. Only males are known. **Male:**

Eyes: Emerald green above. **Thorax:** Black, with yellow interrupted collar anteriorly and two oblique yellow spots below the collar. A narrow yellow line laterally and under side is yellow. **Legs:** Black. Femora of front and middle pair yellow on the inner side. **Wings:**

Transparent. **Wing spot:**
Blackish brown.

Abdomen: Black. The first segment is marked with yellow on the dorsal side and laterally. Dorsal spot on the second segment is perpendicular to the spot on the first. The 3rd to 7th segments have yellow basal rings and terminal segments are unmarked.

Habits and Habitat: Not much is known about this elusive species. **Flight season:** May. **Distribution:** Endemic to Western Ghats. It is known only from Silent Valley National Park, Kerala.



Photo:K.A. Subramanian

Syrandiri Clubtail



Photo:E.Kunhikrishnan

Syrandiri Clubtail seen from above

2. Common Clubtail (*Ictinogomphus rapax*)

Size: **Male:** Abdomen: 52mm, Hind wing: 40mm. **Female:** Abdomen: 50mm, Hind wing: 42-44mm

Description: **Male:** **Eyes:**

Bluish grey. **Thorax:** Black marked with yellow. Collar complete with oblique dorsal spots. Dorsal side of the thorax has a large yellow central spot. The lateral stripes are yellowish green. **Legs:** Black. First two basal segments of leg yellow. Inner surface of the forelegs has a yellow stripe. **Wings:** Transparent.

Wing spot: Black.

Abdomen: Black, marked with yellow. Dorsal stripe and lateral spot on segment 1 and 2 confluent. Basal half of segment 3 is yellow. Segment 4-6 have large dorsal basal spots. Basal half of segments 7 and 8 are yellow. A black wing like projection present in segment 8. **Female:** The female is very similar to the male. The yellow markings are more extensive. Abdomen stouter, laterally compressed and short.

Habits and habitat: This common dragonfly usually perches on a bare twig facing the water. Commonly found in ponds, tanks and rivers. **Breeding:** Breeds both in running and still waters; more frequently in the latter. Pairing takes place over water. Female deposits eggs by quick dipping abdomen over water. **Flight season:** Throughout the year. **Distribution:** Throughout Oriental region.



Common Clubtail



Common Clubtail seen from above

Photo:K.A.Subramanian

Scan:K.A.Subramanian

DARNERS (FAMILY:AESHNIDAE)

Darners are large or medium sized, non-iridescent coloured dragonflies. Eyes meet broadly overhead. The wings are transparent and species like the Blue-tailed Green Darner (*Anax guttatus*) have amber coloured hindwing patches. The abdomen is longer than the wings and often tumid at the base. Most of the darners inhabit marshes, ponds and lakes. Most of the species are diurnal. However a few species like the Parakeet Darner (*Gynacantha bayadera*) are crepuscular. Darners have cosmopolitan distribution and 412 species are known world wide. Within Indian region 42 species are known, of which 8 species are found in peninsular India.



Photo:K.A.Subramanian

Rusty Darner



Photo:K.A.Subramanian

Blue-tailed Green Darner

3. Rusty Darner (*Anaciaeschna jaspidea*)

Size: **Male:** Abdomen: 43-48mm, Hind wing: 41-46mm .**Female:** Abdomen: 43-46mm, Hind wing: 41-43mm

Description: **Male:** **Eyes:**

Bluish grey above pale yellow below. **Thorax:** Reddish brown with two broad greenish yellow stripes on each side. **Legs:** Black, femora dark reddish brown.

Wings: Transparent, suffused with pale amber-yellow. **Wing spot:** Bright ochreous

Abdomen: Reddish brown. A large squarish pale yellow spot is present on each side of first segment and second segment glistening pearly white. Second segment is azure blue dorsally and laterally. The blue and white from the second segment continues to the third segment, which has a pair of dorsal apical yellow spots. Segment 4-7 are rusty with yellow lateral bands and

segment 8 is with a pale spot on lateral and dorsal sides. The 9th and 10th segments are darker with dorsal pale apical spots. **Female:** Very similar to male.

Habits and habitat: A crepuscular species. Flies during dawn and dusk and frequently comes to light at night. This species is common in marshes surrounded by woodland. It is seen upto an altitude of 2200m ASL in the Western Ghats.

Breeding: Breeds in marshes. **Flight season:** Common during August-November. **Distribution:** Throughout the Oriental region.



Photo:K.A.Subramanian

Rusty Darner



Photo:K.A.Subramanian

Rusty Darner seen from above

4. Blue-tailed Green Darner (*Anax guttatus*)

Size: **Male:** Abdomen: 56-62mm, Hind wing: 50-54mm. **Female:** Abdomen: 56-58mm, Hind wing: 52-54mm.

Description: **Male:** Face golden yellow to bright greenish yellow. **Eyes:** Blue with yellow and black behind. **Thorax:**

Pale green. **Legs:** Black. Outer and inner surfaces of anterior femora is yellow. **Wings:**

Transparent. Hindwing with large amber yellow patch. **Wing spot:**

Long narrow and reddish.

Abdomen: The first and second segment is pale green; however the second segment is turquoise blue dorsally. The third segment green with a pair of dorsal triangular turquoise blue spots. This is flanked by a pair of anterior and posterior bright orange spots.

The segment 4-7 has 3 pairs of bright orange spots. In segments 8 and 9 two pairs of orange spots are confluent and segment 10 is entirely yellow. **Female:** The female is similar to the male in most respects. However, the hindwing often lack the amber patch. The turquoise blue of second segment is broken into four square patches.

The orange spots of the abdomen are more confluent. **Habits and habitat:** A diurnal species, which occasionally, comes to light at night. Usually seen perched on bare twigs and makes frequent sallies to catch insects such as small butterflies and dragonflies. This dragonfly is very common near marshes, ponds and big wells.

Breeding: Breeds in marshes. **Flight season:** May-November. **Distribution:** Throughout the Oriental region and occurs up to an altitude of 1800m (ASL) in the Western Ghats.



Blue-tailed Green Darner

Photo:K.A.Subramanian



Blue-tailed Green Darner

Scan:K.A.Subramanian

5. Blue Darner (*Anax immaculifrons*)

Size: **Male:** Abdomen: 52-55mm, Hind wing: 55mm. **Female:** Abdomen: 56mm, Hind wing: 58-60mm.

Description: **Male:** Face is pale uniform pale green.

Eyes: Sapphire blue.

Thorax: Thorax is pale bluish green dorsally and turquoise blue laterally with two black stripes. **Legs:** Black. **Wings:** Transparent and tinted with amber yellow from base to tip. **Wing spot:** Reddish brown. **Abdomen:** The first segment is black and the 2nd segment is turquoise blue with a black “bird in flight” dorsal mark. The segments 3-8 is broadly turquoise blue at its base and have black apical half. The segment 9 is black and 10th segment is black or brown on dorsum.

Female: Is very similar to male but the turquoise blue is replaced by greenish yellow and black by dark reddish brown. **Habits and habitat:** Frequents slow flowing streams. **Breeding:** Breeds in hill streams. Female inserts eggs into a submerged water plant. **Flight season:** Not known. **Distribution:** Oriental region.



Photo:Sahil Latheef

Blue Darner - male



Photo:Sahil Latheef

Blue Darner - male

6. Brown Darner (*Gynacantha dravida*)

Size: **Male:** Abdomen: 50-58mm, Hind wing: 43-50. **Female:** Abdomen: 48-55mm, Hind wing: 44-50mm

Description: **Male:** Face is olivaceous brown with a broad black T-shaped mark on the upper surface. **Eyes:** Olivaceous. **Thorax:** Brown. **Legs:** Reddish brown. **Wings:** Transparent and lightly tinted with reddish brown throughout. **Wing spot:** Reddish brown. **Abdomen:** Pale reddish brown. The third segment is constricted. Apical half of the first segment is black above. Segments 3-8 have dark brown triangular markings above and remaining segments are pale brown. **Female:** Is similar to the male but markings are duller. **Habits and habitat:** A crepuscular dragonfly. Common around weed covered ponds and tanks. Occasionally this dragonfly comes to light at night. **Breeding:** Breeds in weed covered ponds and tanks. **Flight season:** June-November **Distribution:** Oriental region.



Photo:Kishen Das

Brown Darner



Scan:K.A.Subramanian

Brown Darner

7. Parakeet Darner (*Gynacantha bayadera*)

Size: **Male:** Abdomen: 46mm, Hind wing: 44mm. **Female:** Abdomen: 45mm, Hind wing: 43-45mm.

Description: A large green dragonfly. **Male:** Face is pale olive green. **Eyes:** Eyes are deep blue to blue grey above which fade to yellowish green below. **Thorax:** Bright grass green. **Legs:** Yellowish brown. **Wings:** Transparent. **Wing spot:** Bright olive. **Abdomen:** Pale brown to reddish brown above. Segments 1-3 are grass green on the sides. **Female:** Very similar to the male, however, the segments 8-10 are reddish brown. **Habits and habitat:** Frequents reed covered ponds and tanks. A crepuscular insect, often visiting light immediately after the rains. **Breeding:** Breeds in reed covered ponds and tanks. **Flight season:** Throughout the year. **Distribution:** Oriental region.



Photo:K.A.Subramanian

Parakeet Darner



Scan:K.A.Subramanian

Parakeet Darner

MOUNTAIN HAWKS (FAMILY:CORDULEGASTERIDAE)

Mountain Hawks are large black or dark brown dragonflies with bright yellow markings. The eyes are large and they are moderately separated or meet at a point. The wings are transparent or tinted with golden yellow. The abdomen is cylindrical in both sexes or compressed in females. Mountain Hawks are forest species and they fly high above the tree canopy. Species of this family have cosmopolitan distribution and they breed in torrential streams. World over 82 species are known, of which 22 species are recorded from the Indian region. In the Western Ghats, only two species are found and they are restricted to the higher altitudes (>1800m) of Nilgiris and Anaimalais.



Nilgiri Mountain Hawk

Photo:K.A.Subramanian

8. Nilgiri Mountain Hawk (*Chlorogomphus campioni*)

Size: **Male:** Abdomen: 53mm, Hind wing: 45mm. **Female:** Abdomen: 52-55mm, Hind wing: 50mm

Description: A large black and yellow dragonfly with amber coloured wings. **Male:**

Eyes: Eyes are moderately separated and emerald green in colour. **Thorax:** Black with three oblique bright yellow stripes. Underside is black.

Legs: Black with

basal segments and outer side of anterior femora yellow. **Wings:** Transparent with tips dark brown. **Wing spot:** Black and narrow. **Abdomen:** Black with yellow markings. The first segment has a small dorsal spot. Second segment has a complete yellow apical ring and a pair of dorsal crescent marks. Segment 4-7 with narrow paired dorsal yellow crescent marks and the remaining segments are black. **Female:** The colour and markings of body very similar to male. **Wings:**

Transparent and tinted with rich golden yellow. The wing tips are diffusely tipped with blackish-brown. **Habits and habitat:** Confined to high altitude forests. Usually soars above forest canopies descending occasionally to forest clearings.

Breeding: Breeds in torrential streams. **Flight season:** April-September.

Distribution: Restricted to the Western Ghats above 1200m in the region between Nilgiris and Kodagu.



Nilgiri Mountain Hawk

Photo:K.A.Subramanian

SKIMMERS (FAMILY:LIBELLULIDAE)

Skimmers are the most diverse group of odonates. They are large, medium or small dragonflies and non-iridescently coloured. Eyes are always broadly confluent. The wings vary in size, shape, width and colouration. This family has worldwide distribution and is represented by 1139 species. They breed in wide variety of aquatic habitats like puddles, ponds, marshes, rivers, domestic storage tanks and aquaria. Within Indian limits, 95 species are known, of which 50 species are found in the peninsular India.



Fulvous Forest Skimmer - male



Ground Skimmer

9. Trumpet Tail (*Acisoma panorpoides*)

Size: **Male:** Abdomen: 15-18mm, Hind wing: 16-21mm. **Female:** Abdomen: 15-18mm, Hind wing: 17-22mm

Description: A small blue dragonfly with bluged abdomen.

Male: Face is pale blue. **Eyes:** Blue, glossy brown spotted with black behind. **Thorax:** Azure blue, marbled with black.

Legs: Black, femora striped with yellow. **Wings:**

Transparent. **Wing spot:** Pale yellow.

Abdomen: Azure blue in colour. Abdomen from segments 1-5 widely dilated and abruptly slim and cylindrical from segments 6-10. The underside of segments 1-5 have broad black border. Dorsal black stripe broadens at apical borders of segments. The segment 3-5 are with large lateral spots. The segments 6-10 are black, however 6th and 7th segments have a large spot

of azure blue. **Female:** Very similar to the male. **Habits and habitat:** A species closely associated with water. Commonly found among reeds in ponds and tanks.

The species has a very weak and short flight. **Breeding:** Breeds in marshes associated with tanks and ponds. **Flight season:** Not known. **Distribution:** Widely distributed throughout the Oriental region.



Photo: Praveen.J

Trumpet Tail



Photo: Praveen.J

Trumpet Tail seen from above

10. Scarlet Marsh Hawk (*Aethriamanta brevipennis*)

Size: **Male:** Abdomen: 17-20mm. Hind wing: 23-26mm. **Female:** Abdomen: 16mm, Hind wing: 23mm.

Description: A small dragonfly with black thorax and scarlet yellow abdomen. **Male:** The face is covered with short and stiff black hairs. **Eyes:** Dark reddish brown paler towards lateral and undersides. **Thorax:** Dark chocolate brown above, which pales to golden olivaceous-brown on sides.

Legs: Black. Hind femora marked with bright blood-red spot.

Scarlet Marsh Hawk - male
Wings: Transparent and tinted with deep golden amber at base. In the hind wings the amber tint encircles a black opaque area. The venation within this region are bright golden yellow. **Wing spot:**

Blackish brown. **Abdomen:** Bright red contrasting with blackish thorax. **Female:**

Eyes: Dark reddish brown. **Thorax:** Golden-olivaceous above and paler sides.

Legs: Black. The red spot on hind femora of male is replaced by bright yellow.

Wings: Very similar to the male, but opaque black basal spot usually small. **Wing spot:**

Greyish white. **Abdomen:** Golden olivaceous with dorsal black triangular or rhomboidal markings. **Habits and habitat:** Found in weed covered ponds, tanks and ditches. They have adapted to urban environment and could be seen in garden ponds in cities. **Breeding:** Breeds in weed covered ponds and tanks.

Flight season: May-October. **Distribution:** Widely distributed in the Western Ghats and North eastern India.



Photo: John Moore

11. Ditch Jewel (*Brachythemis contaminata*)

Size: **Male:** Abdomen: 18-21mm, Hind wing: 20-23mm. **Female:** Abdomen: 18-20mm, Hind wing: 22-25mm.

Description: **Male:** Face is olivaceous. **Eyes:** Olivaceous brown above bluish grey below. **Thorax:** Olivaceous brown to reddish brown above with two reddish brown lateral stripes. **Legs:** Dark brown in colour. **Wings:** Transparent with reddish venation. A broad bright orange patch extending from wing base to wing spot is present in fore and hind wings. **Wing spot:** Rusty. **Abdomen:** Bright red.

Female: Face is yellowish white. **Eyes:** Pale brown above and bluish grey below. **Thorax:** Pale greenish-yellow, with a narrow brown middorsal stripe. A dark brown lateral stripe is also present.

Legs: Similar to that of the males. **Wings:** Transparent. The bright orange wing patches of males absent. The hindwing tinted with yellow at the base. **Wing spot:** Rusty. **Abdomen:** Pale olivaceous-brown with a black middorsal stripe. In segments 2-6 a subdorsal brown stripe borders the middorsal stripe, enclosing a yellow area.

Habits and habitat: A dragonfly of polluted waters. This species is very common along sewage canals, tanks, ponds and ditches. Sometimes huge congregations (>1000) gather in sewage treatment ponds. Flies very close to the ground and perches on aquatic weeds. **Breeding:** Breeds in ponds, marshes and tanks. **Flight season:** Throughout the year. **Distribution:** Widely distributed in the plains of Oriental region.



Ditch Jewel - male



Ditch Jewel - female

12. Granite Ghost (*Bradinopyga geminata*)

Size: **Male:** Abdomen: 26-29mm, Hind wing: 33-36mm. **Female:** Abdomen: 26-29mm, Hind wing: 32-36mm

Description: A medium sized grey dragonfly with black and white markings.

Male: **Eyes:** Brown above, pale greyish beneath. **Thorax:** Grey thorax is marbled and peppered with black and light grey. **Legs:** Grey.

Wings: Transparent.

Wing spot: Black in the center and white at both the ends. **Abdomen:** Is coloured very similar to the thorax. **Female:** Is very similar to the male.

Habits and habitat: This species is usually seen perched on compound stone walls, boulders etc. It easily merges with such perching sites because of its colouration extremely

varied species quite impossible to catch with bare hands. The species is commonly found near rock pools and other similar small water collections. It is common in the urban landscapes and breeds in overhead tanks and garden ponds. In aquaria larvae tend to destroy fish hatchlings. After sunset it comes for roosting to the same locality day after day. **Breeding:** Breeds in small water collections such as rock pools, overhead tanks etc. **Flight season:** Throughout the year. **Distribution:** Oriental region.



Photo: Natasha Mahatre

Granite Ghost



Photo: Natasha Mahatre

Granite Ghost

13. Emerald-banded Skimmer (*Cratilla lineata*)

Size: **Male:** Abdomen: 30-32mm, Hind wing: 35-38mm. **Female:** Abdomen: 31-32mm, Hind wing: 37-41mm

Description: A medium sized cream yellow dragonfly with iridescent green thoracic stripes.

Male: Frons creamy white in front, iridescent blue or green above. **Eyes:** Dark reddish brown above, which fades to pale blue below. **Thorax:** Cream yellow with lateral iridescent stripes. **Legs:** Black on outer surface and yellow on inner surface. **Wings:** Transparent and tips occasionally brown. In adults wings are smoky brown. **Wing spot:** Yellowish white and long.

Abdomen: Black with broad middorsal and subdorsal yellow stripe.

Female: Very similar to the male. **Habits and habitat:** Large number of these dragonflies can be seen perched on forest understory, often in association with Fulvous Forest Skimmer. Sunlit forest paths and canopy gaps are preferred locations for this species. **Breeding:** Breeds in marshes associated with hill streams. **Flight season:** May-November. **Distribution:** Forested areas of Oriental region.



Photo:K.A.Subramanian

Emerald-banded Skimmer seen from above



Photo:K.A.Subramanian

Emerald-banded Skimmer

14. Ruddy Marsh Skimmer (*Crocothemis servilia*)

Size: **Male:** Abdomen: 24-25mm, Hind wing: 27-38mm. **Female:** Abdomen 25-32mm, Hind wing: 31-37mm.

Description: A medium sized blood red or reddish yellow dragonfly with amber coloured patch at wing base.

Male: Face is blood red. **Eyes:** Blood red above, purple on the sides. **Thorax:**

Blood red to bright orange.

Legs: Reddish.

W i n g s : Transparent base marked with rich amber.

Wing spot: Dark brown.

Abdomen:

Blood red. **Female:** Face is pale yellow. **Eyes:** Eyes are brown above and olivaceous below. **Thorax:** Dark brown. **Legs:** Dark brown. **Wings:** Transparent and basal amber marking paler than in the males. **Wing spot:** Pale yellow.

Abdomen: Yellowish brown with a mid dorsal black stripe. **Habits and habitat:** One of the commonest red dragonflies. Frequently found in ponds, puddles, rivers, big wells, tanks, ditches and paddy fields. This dragonfly perches on aquatic weeds and chases any passing by dragonflies. **Breeding:** Breeds in marshes associated with ponds, rivers and tanks. **Flight season:** Throughout the year.

Distribution: Widely distributed in Oriental and Australian region.



Photo:Kishan Das

Ruddy Marsh Skimmer - male



Photo:E.Kunhikrishnan

Ruddy Marsh Skimmer - female

15. Ground Skimmer (*Diplocodes trivialis*)

Size: **Male:** Abdomen: 19-22mm, Hind wing: 22-23mm. **Female:** Abdomen: 18-20mm, Hind wing: 22-24mm

Description: A small greenish yellow or blue dragonfly with black markings. **Male:** Face is pale azure blue. **Eyes:** Reddish brown above and pale bluish or yellowish below. **Thorax:** Greenish yellow or olivaceous. The dorso-lateral area is violet brown and is speckled with minute dots. In old adults the thorax is covered with fine blue pruinescence. **Legs:** Greenish yellow marked with black. **Wings:** Transparent. **Wing spot:** Dark grey to black. **Abdomen:** The segments 1-7 greenish yellow with middorsal and subdorsal black stripes. Remaining segments black. In old individuals all markings are obscured by fine blue pruinescence. **Female:** Resemble young or sub adult male. Abdominal markings are broader and continued on to segments 8-10. The 10th segment and anal appendages are completely yellow.

Habits and habitat: One of the commonest dragonflies in gardens, fields, playgrounds, etc. This dragonfly usually perches on the ground and rarely flies above 1m. **Breeding:** Breeds in muddy puddles, tanks and pond edges. **Flight season:** Throughout the year.

Distribution: Throughout Oriental region and Pacific islands.



Photo:K.A.Subramanian

Ground Skimmer



Photo: Natasha Mahatre

Ground Skimmer

16. Asiatic Blood Tail (*Lathrecista asiatica*)

Size: **Male:** Abdomen: 27-32mm, Hind wing: 33-37mm. **Female:** Abdomen: 27-32mm, Hind wing: 34-36mm .

Description: A medium sized dark brown dragonfly with blood red tail. **Male:** Face is yellow below and upper surface of frons is steel black or iridescent blue black. **Eyes:** Eyes are broadly confluent. The upper surface is brown and lower surface is bluish grey. **Thorax:**

Dark coppery- brown above and bright yellow on sides. In subadults, the upper surface is coppery brown with two parallel yellow stripes. A narrow lateral yellow stripe extends to mid leg. In addition to this, two black lateral "Y" shaped markings are present. **Legs:** Dark

reddish brown to black. The anterior femora is yellow on inner side. **Wings:** Transparent with smoky brown tips. **Wing spot:** Reddish brown. **Abdomen:** The segments 1-2 with a broad lateral and fine mid dorsal yellow stripe. In older individuals these markings covered by fine bluish white pruinescence. The segments 3-8 are bright crimson red and segments at the tip are black. **Female:** Resemble males, however the abdomen is rich olivaceous brown. A middorsal greenish yellow stripe is present, which is bordered with black lateral stripes. **Habits and habitat:** This shy dragonfly is found in ponds, tanks and marshes. When disturbed, it flies very rapidly. **Breeding:** Breeds in marshes associated with ponds and tanks. **Flight season:** Not known. **Distribution:** Oriental region.



Asiatic Blood Tail -male



Asiatic Blood Tail - female

Photo: Natasha Mahatre

Scan:K.A.Subramanian

17. Fulvous Forest Skimmer (*Neurothemis fulvia*)

Size: **Male:** Abdomen: 21-26mm, Hind wing: 27-32mm. **Female:** Abdomen: 20-24mm, Hind wing: 26-32mm

Description: A medium sized rusty coloured dragonfly with transparent wing tips. **Male:** Face is reddish brown. **Eyes:** Dark reddish brown above, golden brown below. **Thorax:** Reddish brown. **Legs:** Dark reddish brown. **Wings:** Opaque dark reddish brown with an irregular triangular transparent area at the tip of the wing. **Wing spot:** Dark reddish brown. **Abdomen:** Reddish brown. **Female:** Many forms of females are found. Colour of head, thorax and abdomen paler than males or rusty brown. Wings are clear amber yellow with a dark ray extending to the tip in fore wing.

Habits and habitat: A dragonfly of wet forests. Usually perches on fallen logs and shrubs. A large number of them can be found together in canopy gaps and forest edges. **Breeding:** Breeds in marshes associated with forest streams and rivers. **Flight season:** Found throughout the year. However, large number can be seen between May-September. **Distribution:** Forested areas of Oriental region.



Fulvous Forest Skimmer - male



Fulvous Forest Skimmer - female

18. Pied Paddy Skimmer (*Neurothemis tullia*)

Size: **Male:** Abdomen: 16-20mm, Hind wing: 19-23mm. **Female:** Abdomen: 16-19mm, Hind wing: 20-23mm.

Description: **Male:** Face is black.

Eyes: Blackish brown above, vialaceous below. **Thorax:** Black with middorsal cream stripe. **Legs:** Black.

Wings: Basal half is opaque blue black which is bordered by a milky white patch towards the tip. The wing tips are transparent. **Wing spot:** Dull brown. **Abdomen:** Black with a broad middorsal creamy white stripe on the upperside. **Female:** Differs significantly from the male in body markings and colouration. The face is olivaceous yellow. **Eyes:** Pale brown above, which fade to pale olivaceous towards the sides and below. **Thorax:** Greenish yellow with a bright yellow mid dorsal stripe. This stripe is broadly bordered with blackish brown throughout. **Legs:**

The outer surface of legs is yellow and the inner surface is black. **Wings:** Base of the wings bright amber yellow. Front edge of the wing is blackish brown, broadening into a very large blackish brown spot. This spot extend to the rear edge of the wing. In hindwings this spot is irregular or sickle shaped. Tips of all wings are broadly blackish brown. **Wing spot:** Dull brown. **Abdomen:** Bright yellow with a broad black band above. Underside is black.

Habits and habitat: A conspicuous species of ponds, marshes and paddy fields. Flight is slow and weak. Usually perches on twigs, aquatic weeds and other plants. This species is very common along irrigation canals in paddy fields. **Breeding:** Breeds in marshes and ponds. **Flight season:** Found throughout the year. However, peak abundance is during July-September months. **Distribution:** Throughout the Oriental region.



Photo:E.Kunhikrishnan

Pied Paddy Skimmer - male



Photo:E.Kunhikrishnan

Pied Paddy Skimmer - female

19. Green Marsh Hawk (*Orthetrum sabina*)

Size: **Male:** Abdomen: 30-36mm, Hind wing: 30-36mm. **Female:** Abdomen: 32-35mm, Hind wing: 31-35mm

Description: **Male:** Face is yellowish green. **Eyes:** Green mottled with black. **Thorax:** Greenish yellow with black tiger like stripes. **Legs:** Black; inner side of anterior femora is yellow. **Wings:** Transparent; inner edge of hindwing tinted with yellow. **Wing spot:** Black with reddish brown spot.

Abdomen: The segments 1-3 are green with broad black rings and distinctly swollen at the base. **Female:** Is very similar to the male. **Habits and habitat:** A common dragonfly of gardens and fields. This dragonfly perches motionless on shrubs and dry twigs for a long time. Hawks flying insects such as flies, small butterflies and dragonflies. This species can be seen far away from water and occasionally enters houses at night attracted by the light.

Breeding: Breeds in ponds and tanks. **Flight season:** Throughout the year. **Distribution:** Widely distributed in Ethiopian, Oriental and Australian region. It is found throughout Indian subcontinent upto an altitude of 2000m ASL.



Photo:K.A.Subramanian

Green Marsh Hawk



Photo:E.Kunhikrishnan

Green Marsh Hawks mating

20. Blue-tailed Forest Hawk (*Orthetrum triangulare*)

Size: **Male:** Abdomen: 29-33mm, Hind wing: 37-41mm. **Female:** Abdomen: 29-33mm, Hind wing: 37mm.

Description: A medium sized dragonfly with black thorax, black brown patch at wing base and blue tail. **Male:** Face is glossy black.

Eyes: Dark blue. **Thorax:** Velvety black. **Legs:** Black.

Wings: Transparent. The hindwing has a broad triangular blackish brown spot at the base.

Wing spot: Black. **Abdomen:** Broad at the base and gradually tapering towards the tip. The segments 1-2 and 8-10 black. The segment 3-7 azure blue and covered with fine hair. **Female:**

Thorax: Olivaceous green above, often suffused with reddish brown. The sides are dark reddish brown with two bright yellow stripes. **Wings:** The transparent wing is suffused with brown.

The hindwing does not have basal black area instead it is tinted with yellow.

Abdomen: The abdomen is black and without fine hairs. A middorsal yellow or olivaceous green stripe runs from segments 1-7. The segments 2-7 have two yellow spot underneath. **Habits and habitat:** A species of the hills. Usually found in marshes associated with hill streams. **Breeding:** Breeds in brooks flowing through marshes in foothills. **Flight season:** Not known. **Distribution:** It is distributed in the hill ranges of Oriental region.



Photo: John Moore

Blue-tailed Forest Hawk

21. Blue Marsh Hawk (*Orthetrum glaucaum*)

Size: **Male:** Abdomen: 29-35mm, Hind wing: 33-40mm. **Female:** Abdomen: 28-32mm, Hind wing: 32-37mm

Description: A medium sized dragonfly with bluish black thorax and blue tail.

Male: Face is pale olivaceous brown in young adults changing to glossy black in old individuals.

Eyes: Dark green and is capped with reddish brown.

Thorax: In old individuals it is dark dull blue or black with fine black blue or black hair.

Legs: Black. **Wings:** Transparent, with extreme base tinted with dark amber yellow. In old adults, wings are smoky brown.

Wing spot: Dark reddish brown.

Abdomen: Bulged at segments 1-3. Segments 1-8 are pruinosed pale blue



Photo: John Moore

Blue Marsh Hawk - male



Photo: John Moore

Blue Marsh Hawk - female

and the remaining segments black. **Female:** **Thorax:** Olivaceous above bordered by a broad reddish brown lateral stripe. Lateral side is reddish brown with two yellowish-white narrow stripes.

Legs: Black externally and yellow internally. **Wings:** Similar to that of males.

Abdomen: Reddish brown with a broad greenish yellow middorsal stripe. Segments 8-10 are black middorsally.

Habits and habitat: Commonly found in marshes associated with forest streams, plantations and canals.

Breeding: Breeds in Marshes.

Flight season: May-October.

Distribution: Widely distributed in the Oriental region.

22. Crimson-tailed Marsh Hawk (*Orthetrum pruinosum*)

Size: **Male:** Abdomen: 28-31mm, Hind wing: 32-36mm. **Female:** Abdomen: 30mm, Hind wing: 37mm.

Description: **Male:** Face is ochreous to pale reddish brown.

Eyes: Blue black above and bluish grey below. **Thorax:** Is covered with fine hairs and reddish brown to dull purple. **Legs:** Black and reddish brown at the base. **Wings:** Transparent. In old adults, it is pale brown towards the tip. On the fore and hindwings, the basal area is marked with reddish brown. **Wing spot:** Reddish brown. **Abdomen:**

Bright red. In old adults it is purplish due to pruinoscence. **Female:** Face is pale olivaceous. **Eyes:** Yellowish, capped with brown. **Thorax:**

Reddish brown or dull ochreous with indistinct lateral brown stripe. **Wings:** Similar to male but the basal markings are indistinct.

Abdomen: Is dull ochreous with each segment thinly bordered with black. **Habits and habitat:** A very common dragonfly of wells, ponds, ditches, tanks and rivers. Males are very conspicuous and can be seen perched on shrubs, stones etc.

Breeding: Breeds in puddles, ponds and tanks. **Flight season:**

Throughout the year. **Distribution:** Oriental region.



Photo: John Moore

Crimson-tailed Marsh Hawk - male



Photo: John Moore

Crimson-tailed Marsh Hawks - mating

23. Blue-tailed Yellow Skimmer (*Palpopleura sexmaculata*)

Size: **Male:** Abdomen: 14-16mm, Hind wing: 15-21mm. **Female:** Abdomen: 13-14mm, Hind wing: 18-21mm

Description: A small dragonfly with greenish yellow thorax and blue abdomen.

Male: Face is creamy yellow with brilliant iridescent blue frons. **Eyes:** Bluish grey, capped with brown above.

Thorax: Pale greenish yellow. Dorsal side is warm reddish brown. **Legs:**

Bright yellow with black terminal segments. **Wings:** Forewings are transparent with three black streaks extending from the wing base to the tip. A prominent black spot is also present in the wing node. The hind wings are tinted with yellow and have two short black streaks extending from the wing base to the tip. **Wing spot:** Black with central white streak. **Abdomen:** Light blue and covered with pruinescence. The sides of 1&2 and base of 3rd segments yellow. Underside is yellow with a median black stripe. **Female:** Face is yellow without iridescent markings. **Thorax:** Rich orange brown with lateral brown stripe. **Wings:** Transparent and more broadly marked with blackish-brown and black. The amber yellow tint in the hind wing is deeper. **Wing spot:** Black and creamy white. **Abdomen:** Bright reddish brown with a median black stripe. A broad lateral black stripe is also present. **Habits and habitat:** This dragonfly is usually found in marshes associated with bamboo brakes. It resembles wasps in appearance and with slow, circling flight. **Breeding:** Breeds in marshes. **Flight season:** Not known. **Distribution:** Throughout the Oriental region.



Blue-tailed Yellow Skimmer

Photo: John Moore

24. Wandering Glider (*Pantala flavescens*)

Size: Abdomen: 29-35mm, Hind wing: 38-40mm

Description: A medium sized dragonfly with rusty thorax and yellow abdomen. **Male:** Face is bright golden yellow or orange. **Eyes:** Reddish brown above, bluish grey on sides and below. **Thorax:** Olivaceous or rusty and is coated thickly with fine yellowish hair. On sides, it is pale green or bluish green.

Legs: Black. **Wings:** Transparent and base of hind wing amber yellow. **Wing spot:** Bright reddish brown. **Abdomen:** Bright reddish brown and is tinted with brick red dorsally. The segments 8-10 have black spots above. **Female:** Is very similar to the male. Eyes are olivaceous brown above and wings are evenly smoky. The abdomen lacks the dorsal red colouring found in the males. **Habits and habitat:** Most common dragonfly. Huge swarms can be seen just before and after monsoon. Thousands of them swarm over harvesting fields and playground during early morning and evening. They are ubiquitous and migrate in large numbers with the monsoon winds. The swarms usually use clearings such as railway tracks, highways and rivers to migrate. These swarms frequently bump into passing vehicles and die on road. **Breeding:** Breeds in marshes and small puddles. **Flight season:** Throughout the year. However large numbers can be seen between September-December. **Distribution:** Throughout the tropics.



Photo: Natasha Mahatre

Wandering Glider



Photo: Kishen Das

Wandering Glider

25. Yellow-tailed Ashy Skimmer (*Potamarcha congener*)

Size: **Male:** Abdomen: 29-32mm, Hind wing: 33-35mm. **Female:** Abdomen: 29-31mm, Hind wing: 33-37mm

Description: A medium

sized dragonfly with bluish black thorax and yellow tail with black markings. **Male:** Face is olivaceous yellow to steel black or brown.

Eyes: Reddish brown above and bluish grey below. **Thorax:** Black in adults and covered with bluish pruinescence. In young adults, yellow

markings are visible through the pruinescence. **Legs:** Black or reddish brown-.

Wings: Transparent and tipped with brown. **Wing spot:** Dark reddish brown.

Abdomen: Basal segments covered with bluish pruinescence. The segments 1-8 with medial and lateral yellow stripe bordered with black. **Female:** **Thorax:** Is reddish-brown above, fading to dull brown on sides. A medial yellow and brown lateral markings present. **Legs:** Black and femora obscurely striped with yellow.

Wings: Transparent and brown coloured area in the wing tip much more defined.

The yellow tinting of the wings is deeper. **Abdomen:** Similar to male, however the yellow stripe beneath is broad leaving a black narrow stripe. **Habits and habitat:**

Found in weedy ponds and marshes. Large colonies are often found in woods associated with ponds and marshes. **Breeding:** Breeds in marshes. **Flight season:** Not known. **Distribution:** Oriental region.



Photo: John Moore

Yellow-tailed Ashy Skimmer - male

26. Common Picture Wing (*Rhyothemis variegata*)

Size: **Male:** Abdomen: 23-25mm, Hind wing: 33-36mm. **Female:** Abdomen: 20-22mm, Hind wing: 28-37mm.

Description: A medium sized dragonfly with butterfly like yellow and brown wings. **Male:** Frons iridescent green. **Eyes:** Dark reddish brown above. **Thorax:** Iridescent green. **Legs:** Black.

Wings: The forewing is transparent and golden yellow. The wing tip, leading edge and centre of the wing are marked with deep coffee brown spots. The hindwing also has similar spots; however the central spot is absent. More over, the wing base is marked with an irregular brown patch. The trailing edge of the hindwing has a characteristic 'W' shaped coffee brown mark.

Wing spot: Black. **Abdomen:** Black. **Female:** **Wings:**

Black. **Female:** **Wings:** Tips of the forewings is transparent. A dark brown opaque area extends to the centre of fore wing. This area borders a bright yellow hockey stick shaped patch. In hindwings the brown opaque area is more extensive and reaches upto the wing tip, which encloses a long yellow central patch and a small yellow spot towards the wing tip. This patch also borders yellow spots of wing margins. **Wing spot:**

Black. **Abdomen:** Bluish black. **Habits and habitat:** A prominent dragonfly of marshes, paddy fields and ponds. This species is easily mistaken for a butterfly.

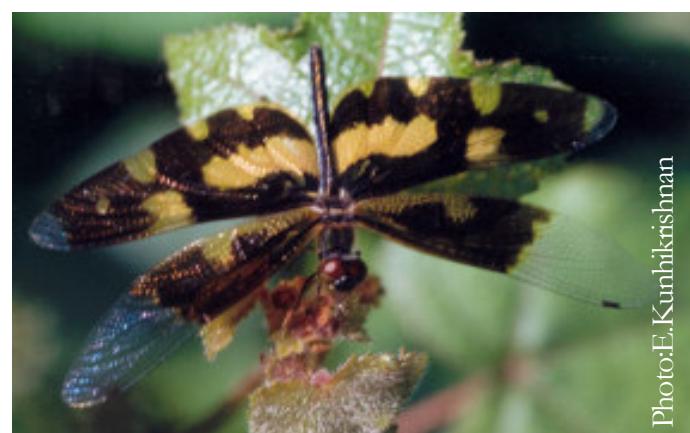
A weak flier and frequently perches on aquatic weeds. This dragonfly is rarely seen away from water. **Breeding:** Breeds in marshes, ponds and paddy fields.

Flight season: Throughout the year, especially near perennial marshes.

Distribution: Throughout the Oriental region.



Common Picture Wing - male



Common Picture Wing - female

27. Pigmy Skimmer (*Tetrathemis platyptera*)

Size: **Male:** Abdomen: 15-18mm, Hind wing: 18-21mm. **Female:** Abdomen: 14-16mm, Hind wing: 19-24mm.

Description: A small, large headed black and yellow dragonfly with amber coloured hindwing patch. **Male:** Face is bright yellow with upper part and side brilliant metallic blue. **Eyes:** Eyes are emerald green in colour. **Thorax:** Black with a bronze green sheen. A narrow median stripe and pair of broad stripe on sides is bright yellow. Underside is yellow with a broad black triangle. **Legs:** Black. **Wings:** Wings are transparent. Base of the forewing and nearly half of the hindwing tinted with amber yellow. **Wing spot:** Black. **Abdomen:** Black with yellow spots on sides. **Female:** Female is very similar to the male, but the amber coloured areas of the wing much deeper. **Habits and habitat:** Common in ponds, weed covered irrigation wells and similar small water collections. Always found close to water. **Breeding:** Breeds in ponds and small stagnant water collections. **Flight season:** Not known. **Distribution:** Throughout the Oriental region.



Photo:K.A.Subramanian

Pigmy Skimmer



Scan:K.A.Subramanian

Pigmy Skimmer dorsal view

28. Coral-tailed Cloud Wing (*Tholymis tillarga*)

Size: **Male:** Abdomen: 28-33mm, Hind wing: 33-37mm. **Female:** Abdomen: 27-31mm, Hind wing: 31-37mm.

Description: A medium sized red dragonfly with brown and white hindwing patch. **Male:** Face is rusty brown with a crimson flush. **Eyes:** Brown capped with reddish olivaceous below. **Thorax:** Reddish above golden yellow or olivaceous on sides. **Legs:** Rustybrown. **Wings:** Transparent with a broad fan shaped golden brown patch on the hindwing. This is bordered by a milky white patch. **Wing spot:** Reddish brown. **Abdomen:** Bright rusty-red. **Female:** Head and thorax olivaceous without any red tinge. Hindwing brown without the milky white border and the brown patch is very pale and obscure. **Abdomen:** Olivaceous brown.



Photo: Kishen Das

Coral-tailed Cloud Wing - male



Coral-tailed Cloud Wing - female

Habits and habitat: A crepuscular dragonfly, active at the time of sunset and flies at night. Frequently comes to light at night. This fast flying dragonfly is very difficult to follow. Commonly found in ponds, marshes and tanks. **Breeding:** Breeds in marshes and ponds. **Flight season:** Throughout the year. **Distribution:** Throughout the Ethiopian, Oriental and Australian regions and Pacific Islands.

29. Red Marsh Trotter (*Tramea basilaris*)

Size: **Male:** Abdomen: 30-35mm, Hind wing: 40-44mm. **Female:** Abdomen: 32-36mm, Hind wing: 38-45mm.

Description: A medium sized red or yellow dragonfly with brown and yellow hindwing patches. **Male:** **Eyes:** Dark reddish brown. **Thorax:** Olivaceous, reddish above and bluish green on sides with a black lateral stripe. **Legs:** Black. **Wings:** Transparent. The hindwing base has a reddish brown marking surrounded by golden amber at the base. The veins in this area are bright golden yellow.

Wing spot: Bright ochreous.

Abdomen: Bright brick-red with median black triangular markings. The segments 4-7 are black with triangular yellow spot on each side. The joints of segments 7-9 are bright yellow. The segments 9 and 10 are black with small spots on sides. **Female:** Face is bright yellow. **Thorax:** Bluish green on sides with two prominent lateral stripes. **Abdomen:** Olivaceous green to yellow with black markings as in male.

Habits and habitat: Marshes and ponds. **Breeding:** Breeds in marshes and ponds. **Flight season:** Not known. **Distribution:** Oriental region.



Scan:K.A.Subramanian

Red Marsh Trotter - male



Scan:K.A.Subramanian

Red Marsh Trotter - female

30. Black Marsh Trotter (*Tramea limbata*)

Size: Male: *Abdomen*: 33-35.5mm, *Hind wing*: 44-46mm. Female: *Abdomen*: 32mm, *Hind wing*: 43-46mm.

Description: A medium sized black dragonfly with blood red tail and black hindwing patch.

Male: Face is olivaceous or bright ochreous in front and dark iridescent violet above.

Eyes: Dark brown above, olivaceous on sides and below. **Thorax:** Olivaceous with reddish suffusion. **Legs:**

Black with reddish brown base. **Wings:** Transparent with reddish venation towards the base. The base of hindwing has an extremely variable blackish brown marking. The veins within this black area are reddish. **Wing spot:** Dark brown. **Abdomen:**

Blood red marked with black triangles above. **Female:**

Very similar to male. However, the black markings on the abdomen are more extensive.

Habits and habitat: This midday flying dragonfly is commonly seen patrolling over water bodies. **Breeding:**

Breeds in ponds, marshes and tanks. **Flight season:** Throughout the year.

Distribution: Widely distributed in Ethiopian and Oriental region.



Black Marsh Trotter



Black Marsh Trotter

31. Crimson Marsh Glider (*Trithemis aurora*)

Size: **Male:** Abdomen: 21-29mm, Hind wing: 24-34mm. **Female:** Abdomen: 19-27mm, Hind wing: 24-24mm

Description: **Male:** Face is reddish brown changing to reddish above. **Eyes:** Crimson above and brown on sides. **Thorax:** Red with fine dull purple pruinescence. **Legs:** Black. **Wings:** Transparent with crimson venation. Base of the wings has a broad amber patch.

Wing spot: Dark reddish brown. **Abdomen:** Crimson with a violet tinge. The base of abdomen is swollen. **Female:** Face is olivaceous or bright reddish brown. **Eyes:** Purplish brown above and grey below. **Thorax:** Olivaceous with brown median and black lateral stripes. **Legs:** Dark grey with narrow yellow stripes. **Wings:**

Transparent with brown tips. The venation is bright yellow to brown and basal amber markings are pale. **Wing spot:** Dark brown. **Abdomen:** Redish brown with median and lateral black markings. The black markings are confluent at the end of each segment and enclose an reddish brown spot. **Habits and habitat:** One of the common dragonflies of wetlands. The males usually perch on dry twigs, aquatic plants and overhead cables. **Breeding:** Breeds in streams, rivers, canals, ponds and tanks. **Flight season:** Throughout the year. **Distribution:** Oriental region.



Photo: John Moore

Crimson Marsh Glider - male



Photo: K.A. Subramanian

Crimson Marsh Glider - male



Photo: K.A. Subramanian

Crimson Marsh Glider - female

32. Black Stream Glider (*Trithemis festiva*)

Size: **Male:** Abdomen: 22-28mm, Hind wing: 26-32mm. **Female:** Abdomen: 21-24mm, Hind wing: 29mm.

Description: **Male:** Frons is dark brown in front and iridescent violet above. **Eyes:** Dark brown above with a purple tinge. It is bluish grey laterally and beneath. **Thorax:** Black, covered with purple pruinescence. This gives a deep blue appearance. **Legs:** Black.

Wings: Transparent, with a dark opaque brown mark at the base of hindwing. **Wing spot:** Black. **Abdomen:** Black covered with fine blue pruinescence. **Female:** Face is dirty brown in front and changes to brown above. **Eyes:** Dark brown above and grey below. **Thorax:** Greenish yellow to olivaceous. A medial and lateral dark brown stripe is present. In addition to this,

on the sides inverted 'Y' shaped stripes present. **Legs:** Black and anterior femora is yellow on the inner side. **Wings:** Transparent with dark-reddish brown tip. **Wing spot:** Black. **Abdomen:** Bright yellow with medial, lateral and ventral black stripes. The medial and lateral stripes are confluent at abdominal segments to enclose a wedge shaped yellow spot. **Habits and habitat:** Very common in slow flowing streams and canals. Usually perches on boulders and aquatic plants. **Breeding:** Breeds in sluggish streams. **Flight season:** May-November. **Distribution:** Throughout Oriental region.



Photo: John Moore

Black Stream Glider - male



Photo:K.A.Subramanian

Black Stream Glider - male

33. Long-legged Marsh Glider (*Trithemis pallidinervis*)

Size: **Male:** Abdomen: 28-32mm, Hind wing: 30-36mm. **Female:** Abdomen: 26-28mm, Hind wing: 30-32mm.

Description: A medium sized yellowish brown dragonfly with long spider like legs. **Male:** Face is yellow or pale brown in front and iridescent purple above.

Eyes: Reddish brown above, brown on sides and bluish grey below. **Thorax:** Olivaceous-brown above with a dark brown triangle. On sides, it is bright yellowish brown with three black stripes on each side.

Legs: Black, long and spidery. The basal half of femora of first pair of legs are bright yellow. **Wings:** Transparent with reddish venation. The forewings have amber coloured basal markings. The wings have a golden sheen when viewed from certain angle. **Wing spot:** Black with creamy white ends. **Abdomen:** Bright yellow with black median and lateral stripes. These stripes are confluent at the end of each abdominal segment to enclose a wedge shaped yellow spot. **Female:** Resemble male and the wings are often tinted with yellow or reddish brown. Base of abdomen is broadly black. **Habits and habitat:** A dragonfly partial to the marshes and weedy ponds. Usually perches on tall aquatic weeds or bare ends of shrubs. The long legs are very noticeable at this time. **Breeding:** Breeds in marshes. **Flight season:** Throughout the year. **Distribution:** Oriental region.



Long-legged Marsh Glider

Photo: John Moore

34. Brown Dusk Hawk (*Zyxomma petiolatum*)

Size: **Male:** Abdomen: 37-43mm, Hind wing: 32-35mm. **Female:** Abdomen: 37-42mm, Hind wing: 32-38mm

Description: A large brown dragonfly with long thin abdomen and brown tipped wings.

Male: Face is pale olivaceous which darkens above. **Eyes:**

Brilliant emerald green.

Thorax: Chocolate brown, paling at sides. **Legs:** Pale reddish brown. **Wings:**

Transparent with dark brown tips. **Wing spot:** Dark and blackish. **Abdomen:**

Dark reddish brown with black rings at the end of each segment. Abdomen is swollen from segments 1-3, then abruptly contracted and slim to the end. **Female:** Very similar to



Scan:K.A.Subramanian

Brown Dusk Hawk

the male. **Habits and habitat:** A crepuscular dragonfly that flies after sunset. This dragonfly occasionally comes to light at night, especially after the first summer showers. **Breeding:** Breeds in ponds, tanks and marshes. **Flight season:** Not known. **Distribution:** Found throughout India and Myanmar up to an altitude of 1000m ASL.

Dragonflies and Damselflies of Peninsular India A Field Guide



K.A. Subramanian

Edition 1.0

2005



Project Lifescape

Series Editor: Madhav Gadgil



Dragonflies and Damselflies of Peninsular India-A field guide

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Edition 1.0



**A collaborative project of Centre
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2005

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Project Lifescape

This book on dragonflies and damselflies of peninsular India represents the fourth fascicle to be published under Project Lifescape. This project is a part of the initiative of the Indian Academy of Sciences to enhance the quality of science education. It aims to publish illustrated accounts of 1,500 Indian species (and higher taxonomic categories such as orders and families) of micro-organisms, plants and animals. These accounts are meant to assist high school, college and postgraduate students and teachers of biology in reliably identifying these taxa. They would also include ancillary information on distribution, ecology and behaviour that would help design field exercises and projects focusing on first-hand observations of living organisms. The information thus generated could feed into a countrywide system of monitoring ongoing changes in India's lifescape to support efforts at conservation of biological diversity, as well as control of weeds, pests, vectors and diseases. Hopefully, the accounts would also stimulate popular interest in the broader spectrum of India's biological wealth, much as Salim Ali's books have done for birdlife over the last sixty years.

About the author:

K.A.Subramanian studied stream insect communities of the Western Ghats for his doctoral thesis. He is interested in fresh water biodiversity conservation, odonate ecology and insect evolution. He is currently a Research Associate at the Centre for Ecological Sciences, Indian Institute of Science, Bangalore, India.



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Foreword

Dragonflies and damselflies are amongst the most attractive of creatures on earth, the first to have conquered the aerial domain. Yet we know little of their diversity in India. Indeed most of the species are yet to be described, but they are all around us, their nymphs key predators in water, the adults, the scourge of gnats and midges. If we get to know them better, we are apt to become more concerned with their welfare. That, in turn would mean broader support for our efforts to conserve, and prudently use, India's rich heritage of biodiversity.

This is the aim of Project Lifescape, to help Indians know more of the wealth of life around us. This is similar to the function of illustrated field guides. In addition we hope to suggest scientific problems of interest that students or amateur naturalists could tackle and contribute to furthering our understanding of Indian ecology.

With this in view, we have published three books: on butterflies, fishes and amphibians of peninsular India. They have had a good reception, but books with colour photographs are still not easily affordable and their reach has remained limited. So we have decided to move on to a new medium, the web. Fortunately, the web is becoming more and more accessible, even in rural India, and web based publishing would increase the reach of the material by many orders of magnitude.

This e-book on dragonflies and damselflies is the first in this series. It is the product of the enthusiasm, interest and energy of a young naturalist, Dr.K.A.Subramanian. We sincerely hope that it would reach out to nature lovers, young and old, all over India, and would be most grateful for any and all manners of feedback.

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India

PREFACE

The wings of dragonflies and damselflies (odonates) flag the triumph of metazoa over land and air. The ancestors of extant odonates date back to carboniferous era, about 250 million years ago. Odonates are primarily aquatic insects and their life history is closely linked to specific aquatic habitats. This habitat specificity makes them a good indicator of wetland health. India with its unique geography and diverse bioclimatic regions, support a rich odonate fauna. Thanks to the work of Fraser, the Indian odonate fauna is well documented in his monumental work-The Fauna of British India-Odonata (1933-1936). He describes 536 species within Indian region. Though the Indian odonate fauna is well known taxonomically, natural history and ecology is documented only of a few species . Even basic facts such as geographic and seasonal distribution of most of the species are barely known.

This poor documentation of natural history and ecology of odonates is largely due to non-availability of simple identification guides. The currently available books are highly technical and inaccessible to students and amateur naturalists. The consequence of this vacuum is very well reflected in popular natural history articles and documentaries, where many beautiful odonates are just labeled as “dragonflies” or “damselflies”.

This field guide is an attempt to fill the vacuum by providing description and photographs of 60 Indian odonates belonging to 12 families. Some species are rare and few of them are endemic to the Western Ghats. The family Torrent Hawks (Cordulidae) is not included in this version. Novelty of this guide is the introduction of common English names to families and species of odonates. In addition to new names, I have also used some names like Club Tails, Darners and Skimmers which are already in use. In fact, it was field guides with common English names and colour plates that popularized study of the birds and butterflies among amateurs. The names I

have introduced are along the lines of common English names for birds and butterflies. I hope that this will generate wider interest in odonates among students and naturalists.

World over, web based resources have emerged as a powerful tool for identification of organisms and dissemination of information concerned with biodiversity conservation. Recognizing the importance of web based tools for biodiversity conservation, the first edition of this field guide will be freely available in electronic form. I hope interest generated through this initiative will help in better understanding of Indian odonates and also improve the subsequent editions of this field guide.

K.A.Subramanian
Bangalore
November, 2005

Acknowledgements

This field guide is an outcome of extensive field work done on stream insects as part of the Western Ghats biodiversity network initiated by Prof. Madhav Gadgil at the Centre for Ecological Sciences, IISc, Bangalore. I am grateful to him for giving me an opportunity to work in the network and for his encouragement while working on this fascicle. This book would not have attained this shape without the critical reviews of Prof. C.A.Virakatamath, Prof.T.C.Narendran, Prof. K.G.Sivaramakrishnan, Dr. Ranjith Daniels, E. Kunhikrishnan, Dr. Vincent Kalkman, Dr. Keith Wilson, Nancy Vander Poorten, Michael Vander Porten, Merry Zacharia and Krushnamegh Kunte. I thank them for their valuable comments and suggestions. I thank Natasha Mahatre, Kunhikrishnan, John Moore, Krushnamegh, Praveen, Shahil Lateef, Sivan, Srinidhi, Kishen Das and Tarique Sani for generous contribution of photographs. Last but not least, I thank my wife Shobana for her meticulous editorial corrections and designing the layout for this book.

K.A.Subramanian
Bangalore
November, 2005

BIOGEOGRAPHIC REGIONS OF ASIA, AFRICA AND AUSTRALIA. INDIA AND OTHER SOUTH EAST ASIAN COUNTRIES ARE IN ORIENTAL REGION.



Geographic scope of the field guide

Satellite image of India showing geographic features and regions of the peninsular India.

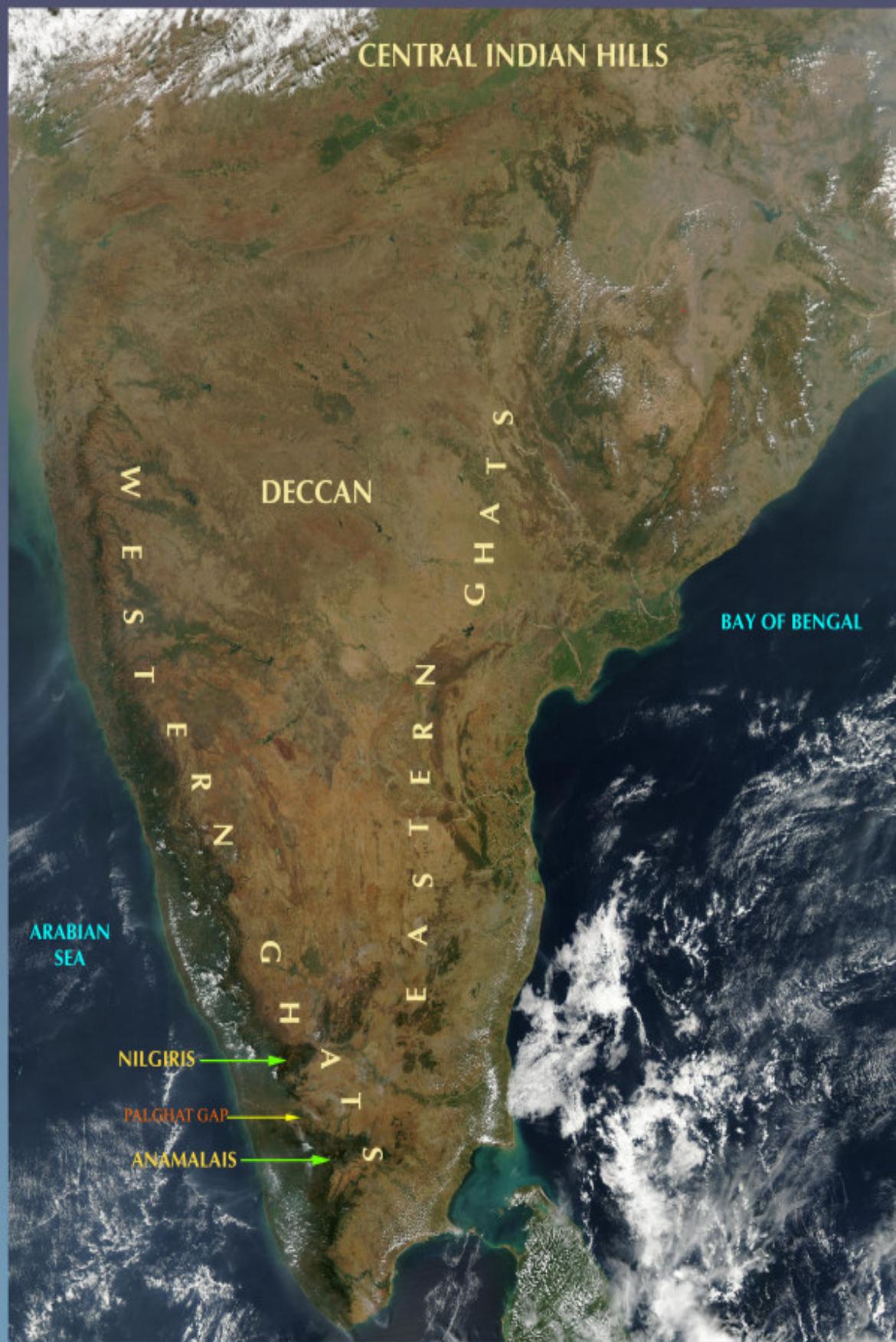
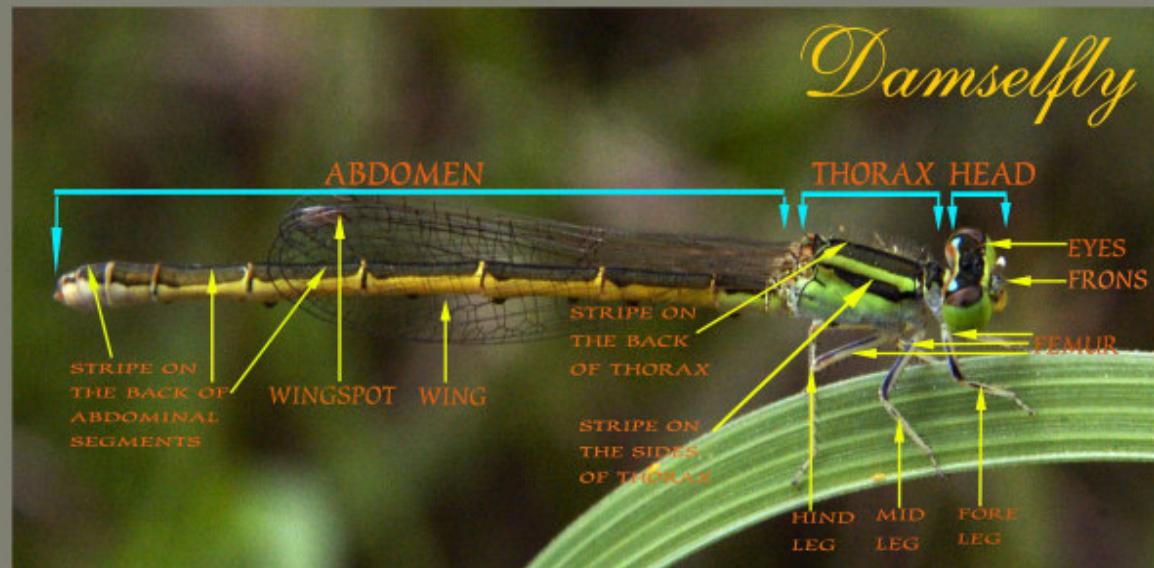
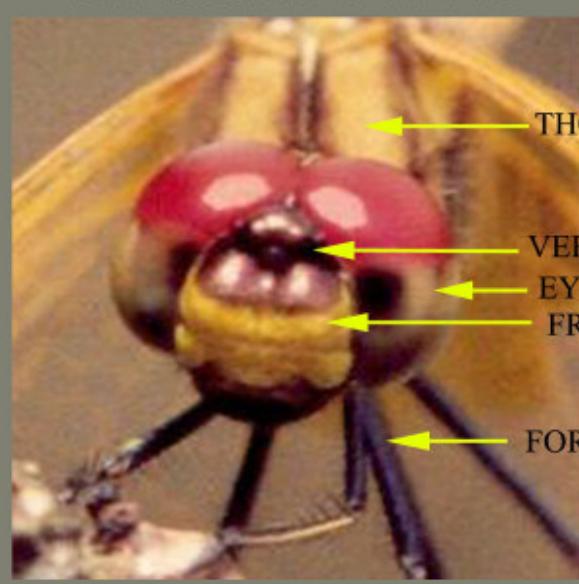


Image courtesy: <http://visibleearth.nasa.gov>

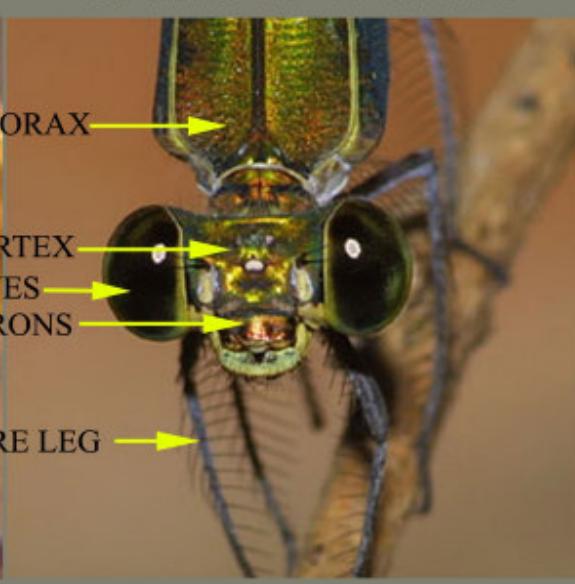
Body Parts of Dragonflies and Damselflies



DRAGONFLY HEAD



DAMSELFLY HEAD



NATURAL HISTORY OF DRAGONFLIES AND DAMSELFLIES (ODONATA)

Introduction

Dragonflies and damselflies collectively called odonates, are one of the most common insects flying over forest, fields, meadows, ponds and rivers. About 6,000 extant species are distributed all over the world. India is highly diverse with more than 500 known species. Odonata are one of the ancient orders of insects. It first appeared during the Carboniferous era, about 250 million years ago along with mayflies (Ephemeroptera). Odonata of the Carboniferous era consists of giants; for example *Meganeuropsis americana* from that era had a wingspan of 71 cm, almost the span of a pigeon. Dragonflies and mayflies are ancient groups of insects, which amongst others, were the first to develop wings and venture into air. Dragonflies mastered the art of flying and continue to be the masters aerobats.

Based on morphology, the order Odonata are divided into three groups, viz. damselflies (Zygoptera), Anisozygoptera and dragonflies (Anisoptera). The suborder Anisozygoptera is a living fossil with two species of which *Epiophlebia laidlawi* is known from Darjeeling. Dragonflies and damselflies can easily be distinguished in the field (Table 1, Fig.1-6). Although they differ considerably in morphology, their general life histories are comparable.





Fig 1: A male Damselfly (Golden Dartlet)



Fig 2: A male Dragonfly (Pied Paddy Skimmer)

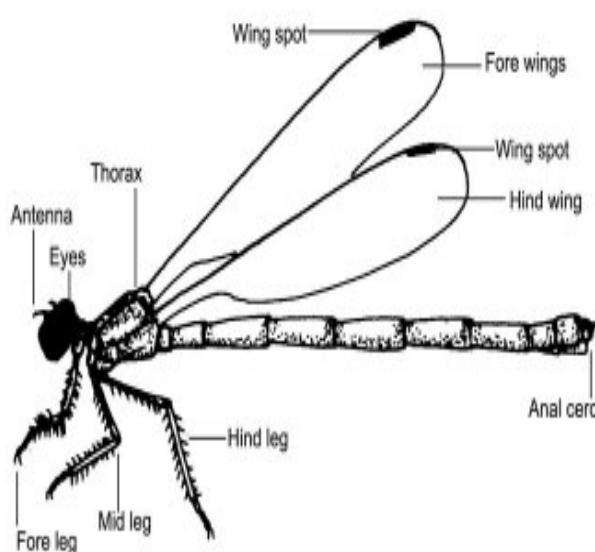


Fig. 3 Body parts of a Damselfly

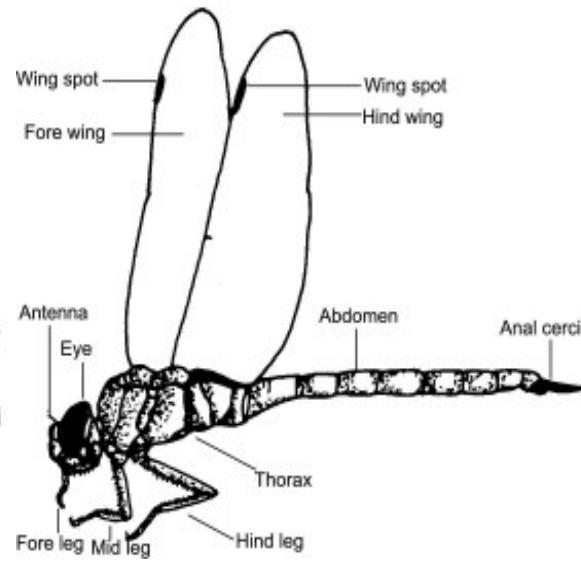


Fig.4 Body parts of a Dragonfly

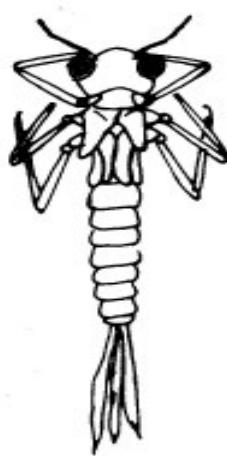


Fig. 5 Damselfly larva

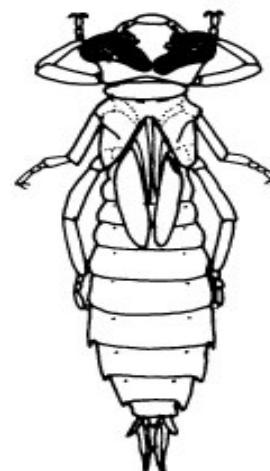


Fig. 6 Dragonfly larva

Dragonflies (Anisoptera)	Damselflies (Zygoptera)
<ol style="list-style-type: none"> 1. Fore wings and hind wings unequal in size; hind wings broader at the base than fore wings. 2. Hind wing broad at base. 3. Wings spread out at rest. 4. Strong agile fliers. 	<ol style="list-style-type: none"> 1. Fore wings and hind wings approximately of the same size and shape. 2. Wings narrow at the base. 3. Wings usually held together dorsally over thorax and abdomen. 4. Comparatively weak fliers.
Larvae	Larvae
<ol style="list-style-type: none"> 1. Stout, robust body. 2. Gills not visible externally. 	<ol style="list-style-type: none"> 1. Slender, fragile body 2. Three gills at the end of abdomen, visible externally.

Table.1 Broad differences between dragonflies and damselflies

Habitat

The life history of odonates is closely linked with water bodies. They use a wide range of flowing and stagnant water bodies. Even though most species of odonates are highly specific to a habitat, some have adapted to urban areas and make use of man-made water bodies. Habitat specificity has an important bearing on the distribution and ecology of odonates. Some species use specialized habitats such as those shown below (Fig 7-11).

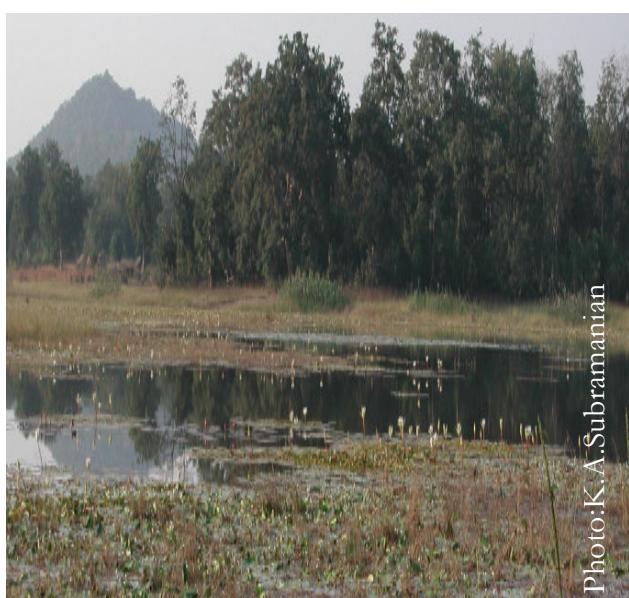


Fig.7 Pond



Fig.8 Riffle in streams

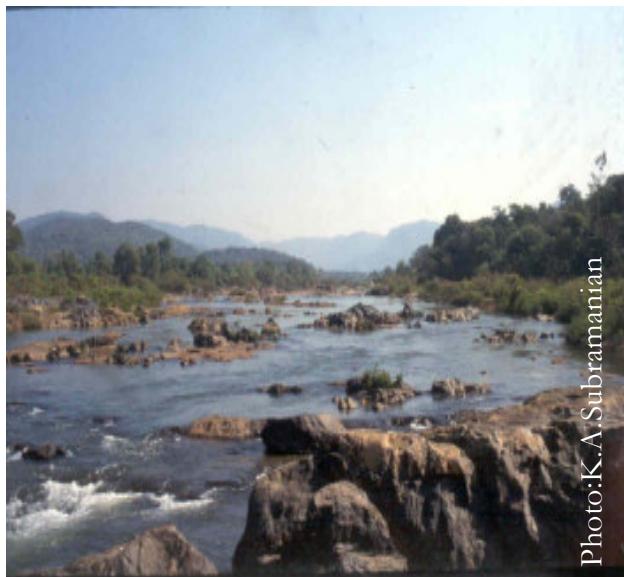


Photo:K.A.Subramanian

Fig. 9 Runs in rivers

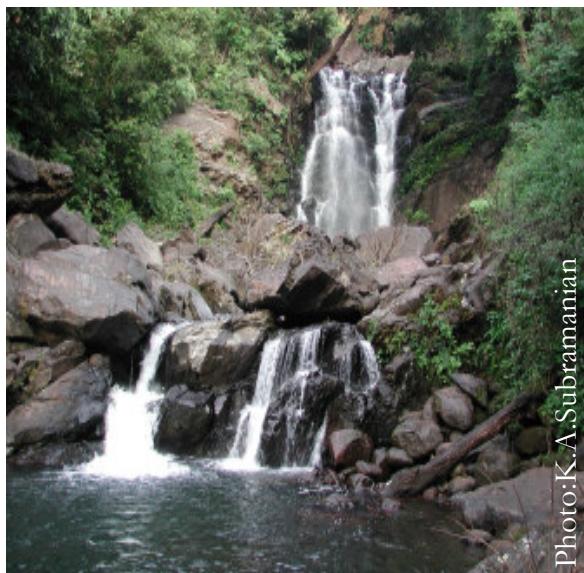


Photo:K.A.Subramanian

Fig. 10 Waterfalls

The species of hill streams tend to be narrowly distributed when compared to pool breeders, which are widespread.

Life cycle

Eggs

Odonates lay their eggs (Fig. 12) in a wide range of aquatic habitats, from damp soil to waterfalls. Females select the egg-laying site mainly by physical characters such as the length of the shoreline. Species, breeding in rivers select either slow flowing or fast flowing sites depending on the ability of their larvae to cope with moving water. It has been observed that long straight shores of lakes are sometimes colonised by riverine species. Visual cues also play an important part in egg laying. Many pool breeders are deceived by

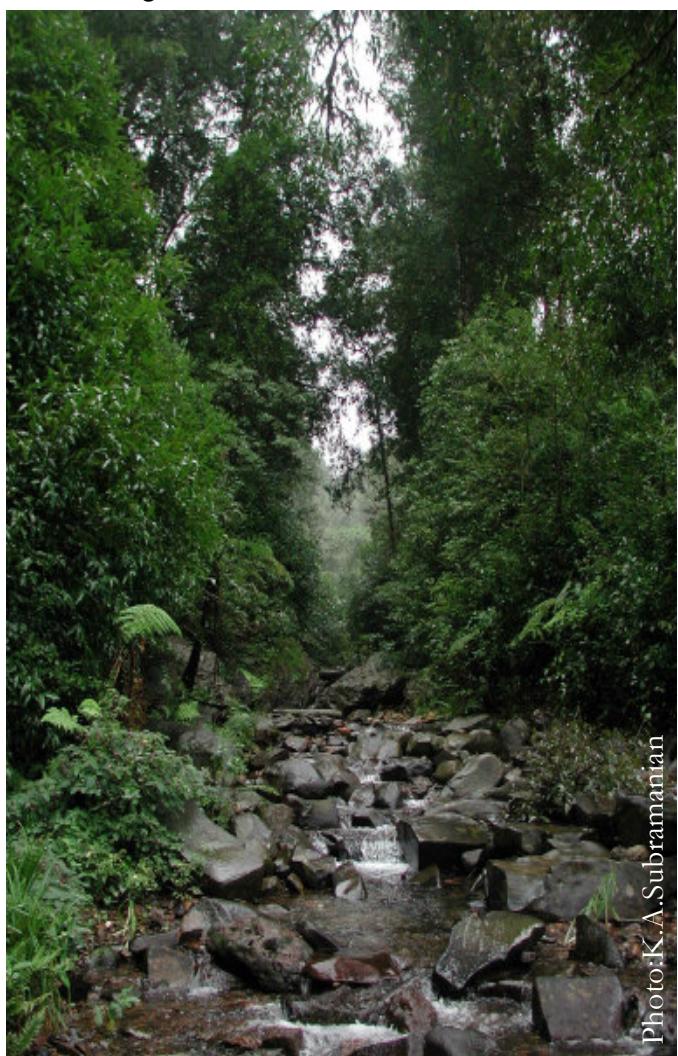


Photo:K.A.Subramanian

Fig. 11 Cascade in streams

smooth shining surfaces, such as bonnets of cars and wet roads and they often try to lay eggs in these deceptive sites.



Fig. 12 Damselfly (Blue Bush Dart) laying eggs. Note how the male holds the female while she lays egg.

Many dragonflies lay their broad and elliptical eggs either in flight or by perching on an overhanging vegetation or rock. Eggs are laid in successive batches: a damselfly lays about 100-400 eggs and dragonflies, usually about several hundreds to thousands per batch. Eggs hatch in 5-40 days in the tropics. Eggs of temperate species may over-winter and hatch in about 80-230 days. In many stream dwelling dragonflies the eggs are invested with gelatinous substance which expands and becomes adhesive on contact with water. This helps the egg from being carried away far from its habitat by water current.

Damselflies insert their elongate and cylindrical eggs into a aquatic plant. Their elaborate ovipositor is serrated and adapted for making incisions in the tissues of plants and placing the eggs in them. Some are generalists and some are specific in their selection of the plant for egg laying. Host specific association sometime effectively determines the distribution of species such as *Coenagrion armatum* in Britain where it was closely associated with *Hydrocharis morsus-ranae* before it became extinct.

Larval stages

The larva is a sophisticated predator (Fig.13). Their cryptic colouration and keen eyesight make them an effective predator. Larvae are generally ambush predators, that is they wait for their prey to come close before striking. But some systematically stalk their prey much like birds of prey or as tigers do. When they are in the striking range they shoot-out their formidable jaws which virtually stab the prey (Fig.14).



Photo:K.A.Subramanian

Fig.13 Damselfly larva (Nilgiri Torrent Dart).



Photo:K.A.Subramanian

Fig. 14 Damselfly larva (Nilgiri Torrent Dart) showing jaw



Photo:K.A.Subramanian

Fig.15 Emerging dragonfly (Blue Tailed Green Darner)

They are gluttonous and feed on any moving and seizable prey including their own kind. Last instar larvae of bigger species are known to catch even small fishes, tadpoles and freshly emerged adults of their own species.

In dragonflies, the inner surface of the rectum has become foliate and richly supplied by trachea. These foliations or “rectal gills” are the respiratory organs. Pumping movements of the abdomen continually renew water in the rectum. In

damselflies, there are foliaceous lamellae at the end of the abdomen. They are the supplementary respiratory devices in addition to rectum, in the body surface and wing sheaths through which also gaseous exchange occurs.

Some larvae can complete development in two months. The number of larval instars is variable within and between species and is usually 9-15. When they are ready to moult, stop feeding and crawl up to emergent vegetation or rock (Fig.15-17). This usually happens after sunset and the larvae moult into adults just before sunrise. The newly emerged adults are wet and delicate, and as the day warms up, they become dry and fit for their maiden flight. Some of the tropics and warm temperate regions often complete one or more generations per year.



Photo:E.Kunhikrishnan



Photo:K.A.Subramanian

Fig. 16 Emerging damselfly
(Nilgiri Torrent Dart)

Fig. 17 Larval cases of an aeshnid (top)
and libellulid (bottom)

Adult stage

Newly emerged male and female odonates leave their emergence site and inhabit nearby landscape. Generally males travel farther than females. Damselflies complete their maturation period in about a week or less whereas dragonflies take approximately two weeks. During the maturation period, sequential changes occur in the colour of the body and wings. In a few species maturation period serves as a resting stage and lasts about 8-9 months.

Flight

Odonates surpass all other groups of insects in their flying skills. Odonates have uncoupled wings, that is unlike moths, butterflies, wasps and bees, fore and hind wings are unattached to each other and they beat independently. The powerful thoracic muscles help them in long sustained flight and good maneuverability (Fig.18-19). Odonates can hover and turn 180° while in flight and can fly backwards. Dragonflies are stronger fliers than damselflies and they can reach a speed up

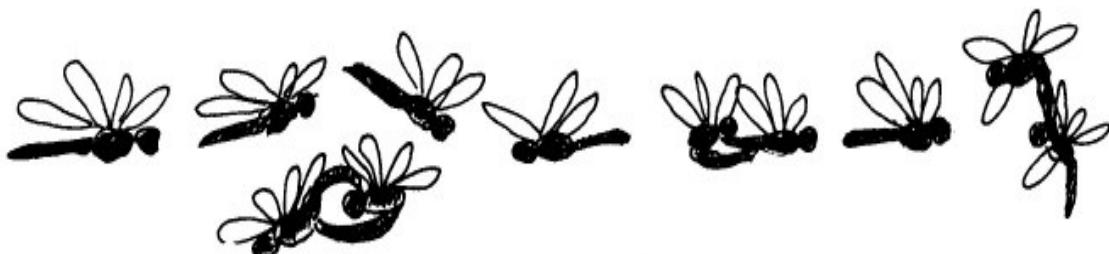




Photo: Natasha Mahatre

to 25-30 km per hour. The difference in flying abilities influences their dispersal and geographic distribution. It is generally observed that big and powerful fliers have wider geographic range than small and weak fliers do. Some weak fliers are dispersed by wind. For

Fig. 18 Dragonfly in flight (*Wandering Glider*)

example, *Agriocnemis pygmaea* has a weak flight and is dispersed by wind throughout Asia and Australia.

Like many other organisms, dragonflies also migrate. Generally it is observed that dragonflies which breed in temporary pools migrate. One of our most common species, *Pantala flavescens* migrates



Photo: John Moore

Fig.19 Damselfly in flight (*River Helidor*)

immediately after the monsoons. Large swarms of these dragonflies move through prominent clearings in the landscapes such as highways and railway tracks. It is not yet clear how and where they migrate.

Feeding

Adult dragonflies are aerial predators and catch insects like mosquitoes, midges, butterflies, moths, bees and odonates on flight (Fig.20). Most of the dragonflies are day flying but a few actively hunt during twilight hours. Darter dragonflies capture their prey by perching at a vantage-point and making short sallying flights and hawker dragonflies hunt by flying continuously. In this, they resemble insectivorous birds like flycatchers and swifts respectively. Large numbers of adults sometimes congregate especially during dawn and dusk near tree canopies to feed on swarming insects. They feed in flight, using the legs to capture the prey and transfer

it to the jaws. The legs are highly specialised for this purpose, particularly with regard to its position, relative length, articulation and complement of spines. Their vision is well developed as in butterflies and as far as modern Anisoptera are concerned, most of the head is made up of eyes.

Reproduction

Sexually matured dragonflies return to breeding habitat from their foraging or roosting sites. Usually males mature earlier than females and reach the breeding habitat first. Mature males hold territory, but species may or may not show pronounced site fidelity. Resident males show aggressive behaviour towards conspecific males, which enter their

territory. Aggressive behaviour may be simple “wing warning” by perched males (Fig.21) and a display of the abdomen. More elaborate aggressive encounters occur in flight, progressing from mutual threat display to physical fighting.

Most odonates are sexually dimorphic when they mature. Newly emerged males and females are similarly coloured. Males acquire bright colouration as they become sexually mature.

Colours and patterns on the wings and body may play an important role in territoriality and courtship. Courtship is more evident in damselflies than in dragonflies. It ranges from simple submissive posture by males towards approaching females to elaborate displays where the male flies towards an egg laying site and allows itself to be carried by the water current for a short distance. Competition over sexually receptive females is very intense among male odonates.

A receptive female adopts a characteristic posture towards a potential male and pairing follows immediately. The last abdominal segments of the male have claspers, which are used to hold the female by her thorax. The structure of



Photo: John Moore

Fig. 20 Damselfly (*Senegal Golden Dartlet*) feeding on newly emerged *Bush Dart*.



Photo: John Moore

Fig. 21 Territorial display of male damselflies (*Stream Glory*)



Photo: E. Kunhikrishnan

Fig. 22 Mating of Dragonflies (*Green Marsh Hawk*)



Photo: Natasha Mahatre

Fig. 23 Mating of Damselflies (*Senegal Golden Dartlet*)

the female thorax is such that the male clasper fits exactly into it. This lock and key mechanism prevents mating across closely related species. During copulation or just before that, the male transfers his sperms into an accessory genital organ at the second abdominal segment (Fig. 22-23). This accessory genitalia is a complicated harpoon-shaped structure, which can be used to remove sperms from previous couplings before insemination. Multiple mating in both males and females is common among odonates.

Egg laying

Egg laying commences immediately after copulation. In many cases, the male continues to hold the female and flies with her to an egg-laying site or just accompanies her. It is usually observed that territory holding males accompany females and non-territory holding males maintain physical contact

with the female while laying egg. Usually during this period the female is very vulnerable to the attack by other males. Non-mated males attack the mated pair and try to hijack the female. Some damselflies lay eggs in submerged plants. In such cases the hovering male anchors the egg-laying female (Fig.12).

Longevity

Most of the records of longevity in nature refer only to the reproductive period. During this, most damselflies live up to 8 weeks and dragonflies up to 6 weeks. If maturation period is included, it may extend up to 7-9 and 8-10 weeks, respectively. It is known that aestivating spread wings (Lestidae) can live much longer as adults.

Dragonflies encounter a large number of predators throughout their life. Fishes are important predators during the larval stage. Birds such as Hobby (*Falco subbuteo*), Bee-eaters (*Merops sp.*), Kingfishers, Herons and Terns have been observed to feed on odonates (Fig. 24).

Large dragonflies, robberflies (Asilidae) and spiders are important invertebrate predators. Small Hymenoptera belonging to the families *Mymaridae*, *Eulophidae* and *Trichogrammatidae* parasitise eggs of damselflies. Parasitizing females climb or swim beneath the water to search for the eggs in the



Photo: Natasha Mahatre

Fig. 25 Damselfly female (Golden Dartlet) infested with mites

submerged plants. Many migrating species are intermediate hosts of avian trematode parasites like *Prosthogonimus*. During mass emergence of these

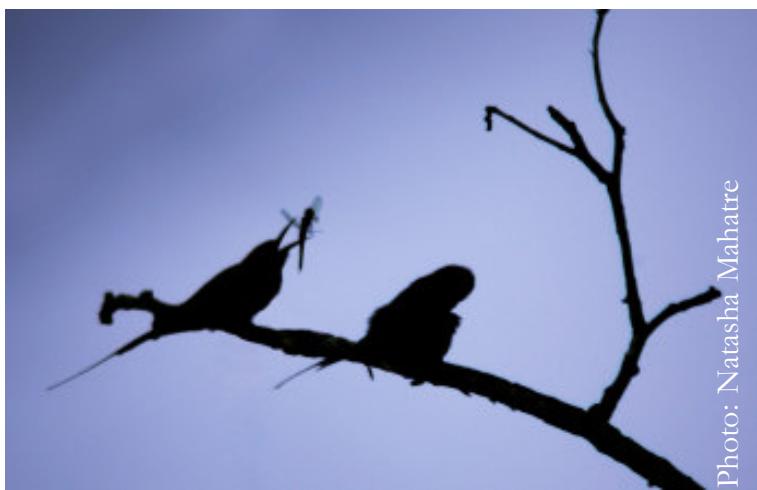


Photo: Natasha Mahatre

Fig. 24 Small Green Bee-eater (*Merops orientalis*) feeding on a dragonfly

species, aquatic birds such as sandpipers, terns, gulls and herons feed on them. This predation forms an important link in the transfer metacercariae and cysts of the parasite.

Larval stages of water mite (Hydrachnidia) parasitise odonates. For example, *Arrenurus cupidator* is a common ectoparasite of coenagrionid damselflies. The mite larvae infest the final instar host larvae. The larvae briefly feed on the host larvae and when the adult damselfly emerges, the mite larvae get attached to the adult host (Fig.25).

Mite larvae pierces the host body and starts feeding. The larvae detach only when the host comes back to water for egg laying. The detached mite larvae complete two more larval stages as predator before moulting into an adult.

Human significance

Odonates, being predators both at larval and adult stages, play a significant role in the wetland ecosystem. Adult odonates feed on mosquitoes, blackflies and other blood-sucking flies and act as an important biocontrol agent of these harmful insects. In the urban areas of Thailand, larvae of the container breeding dragonfly, Granite ghost (*Bradinopyga geminata*) was successfully used to control *Aedes* mosquito, an important vector of the dengue fever (Fig. 26). Many species of odonates inhabiting in agro ecosystems play a crucial role controlling pest populations.

Bio indicators

In addition to the direct role of predators in ecosystem, their value as indicators of quality of the biotope is now being increasingly recognised. For example, in South Africa it has been shown how species assemblages of dragonflies change with levels of human disturbance. Dragonflies found at undisturbed habitats with good riparian vegetation were specialists with narrow



Fig. 26 The Granite Ghost is very efficient in urban mosquito control

Photo: Natasha Mahatre

distribution. On the other hand, species recorded at industrial land or urban areas with disturbed riparian vegetation were generalists with wide habitat preference and distribution. These studies also show that dragonflies are sensitive not only to the quality of the wetland but also to the major landscape changes, especially changes in the riparian zone. Recent studies on dragonfly ecology from Western Ghats indicate families like Bamboo tails, Reed tails, Glories, Torrent darts, Torrent Hawks and Club tails are good indicators of health of riverine ecosystem.



Photo:E.Kunhikrishnan

Fig.27 Presence of damselflies such as Nilgiri Torrent Dart indicates unpolluted hill streams.



photo:K.A.Subramanian

Fig. 28 Damselflies such as Myrisitca Bamboo Tail is found only in highly threatened myristica swamps.

Conservation

Though the Indian odonate fauna is well described in terms of adult taxonomy, their ecology is poorly known. Larval stages of only 76 Indian species are known and the full life history is documented for only 15 species. A good understanding of larval ecology is crucial for odonate conservation. The paucity of ecological information is a serious lacuna when designing any conservation measure. The impact of landscape changes going on since last fifty years or so in the peninsular India on dragonfly distribution and status is not known. This can be tackled only by fresh field surveys to know the threat status and distribution of many species. Future studies on dragonflies may be directed to have a comprehensive understanding

of their ecology and their value as a biomonitoring tool. There is no comprehensive account of Indian odonates after Fraser's fauna volumes published during 1930's. Recent

assessment by IUCN Red Data Books (International Union for Conservation of Nature, 2004) lists *Burmagomphus sivalikensis*, *Cephalaeschna acutifrons* and *Epiophlebia laidlawi* as threatened Indian odonates. All the three species are restricted to North East India. However a large number of endemic odonates are threatened due to large scale habitat destruction. For example, *Myristica* Bambootail (Fig. 28) the monotypic damselfly of the Western Ghats is restricted to *Myristica* swamps of evergreen forests (Fig. 29). The swamps are very restricted geographically within the ghats. The swamps are being drained in an unprecedented scale for agriculture expansion, especially for the arecanut plantations. Draining of the swamps have caused irreversible damage to the breeding habitat of this species.

The case of *Myristica* Bambootail is only one example. About 67 species of peninsular Indian odonates are endemic. Most of these species are restricted to the riverine ecosystem. Large scale habitat alterations such as damming, channel diversion, sand mining and pollution is seriously threatening the survival of these species. Long term conservation of odonates and other freshwater biota can only be assured through appropriate national level policy interventions and definite freshwater biodiversity conservation programmes.



Photo:K.A.Subramanian

Fig. 29 A *Myristica* swamp, the habitat of *Myristica* Bambootail



Photo:K.A.Subramanian

Long legged Marsh Glider (*Trithemis pallidinervis*)

STUDYING DRAGONFLIES AND DAMSELFLIES

Why study dragonflies and damselflies

Dragonflies and damselflies are amongst the prominent and colourful insects in tropical landscapes. In addition to providing aesthetic pleasure, studying them could give us valuable insights about ecosystem health, especially of wetland. Being very specific about breeding habitat, odonates are sensitive indicators of the health of wetland and its landscape. Odonates are also very good subjects in study of behaviour, ecology and biogeography.

Where to watch

Odonates are found in a diverse habitat. However, their diversity and abundance vary with the habitat. Best place to see various odonate species and their behaviour is near freshwater bodies such as ponds, tanks, streams and rivers where there is good sunlight.

When to watch

Best time to watch odonates is during midday. They are most active during this time. Some species are crepuscular or nocturnal. It is very difficult to locate and observe them in low light conditions. Many of our odonate species are seasonal and their emergence and breeding coincide with the monsoon. So most of our odonate species can be observed between May-November.

How to watch

Most of the odonates can be observed at very close range. Flying odonates or odonates perched in inaccessible areas can be observed through binoculars. Due to their sensitive eye, odonates get easily disturbed with bright coloured objects. So it is better to wear dull coloured clothing and cap, especially when photographing.

Identifying odonates

A large number of odonate species can be identified without collecting them. However, females and young adults are difficult to identify in the field. Most of the

damselflies can be collected by hand. For collecting dragonflies, a butterfly net with dark coloured clothing is the best. Odonates are very delicate insects and they get easily killed while handling, especially when they are held by abdomen or the thorax. So, while handling odonates avoid holding by abdomen or the thorax. The wings are relatively tough and odonates can be held by wings between fingers for a short time. A detailed sketch of the live insect with colour and patterns is very important for accurate identification. An example from field notes on *Euphaea dispar* is given in figure 31.

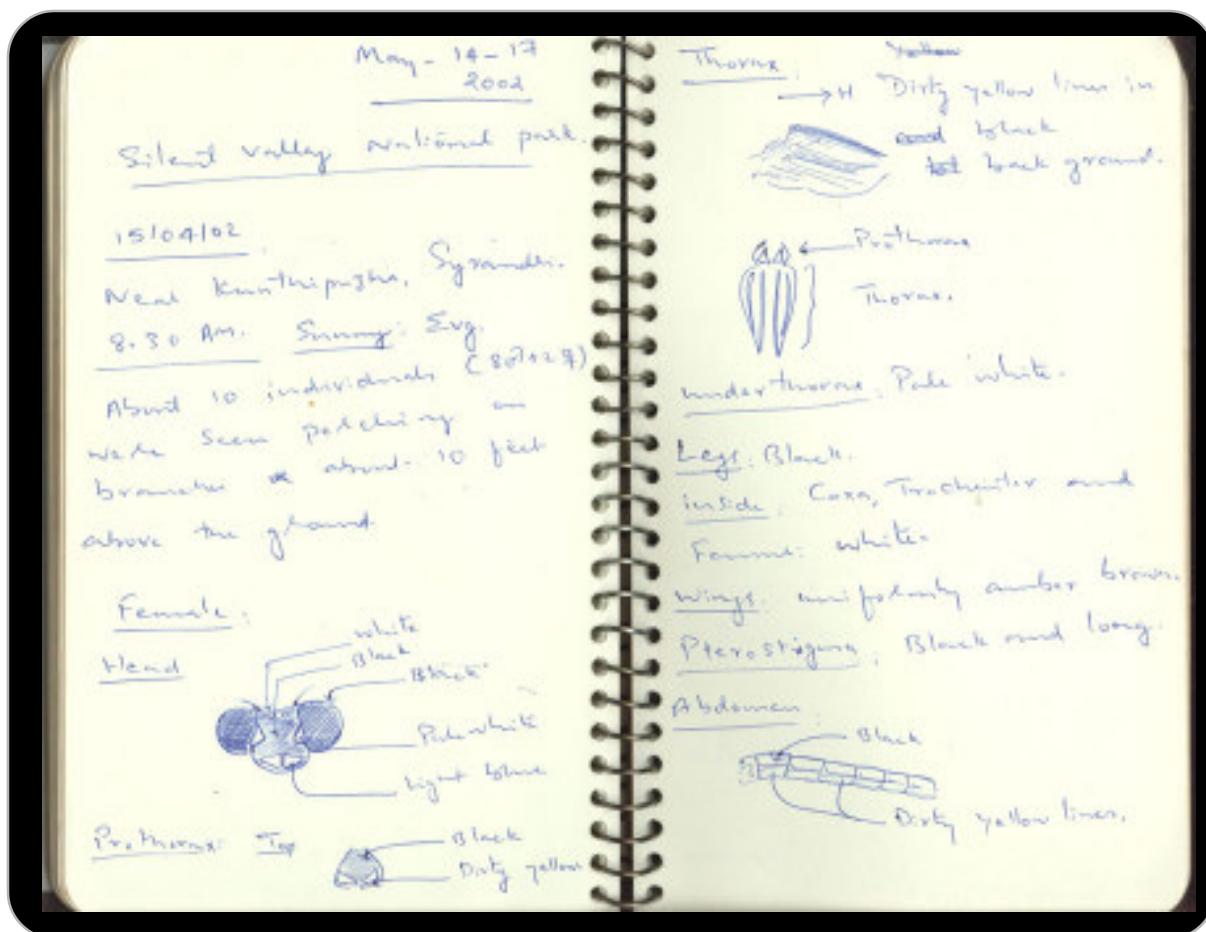


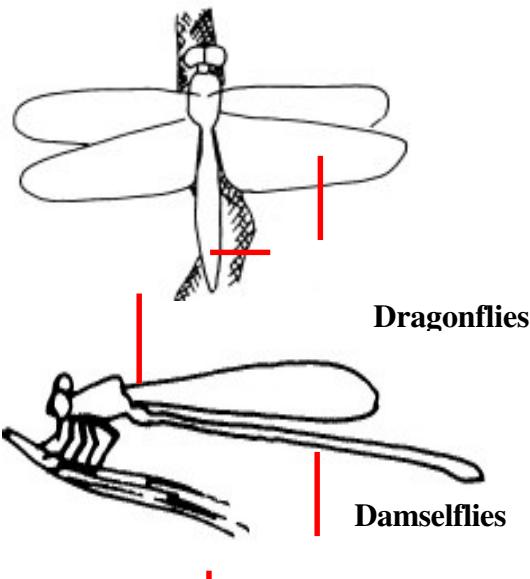
Fig.31. Sample of a field note book for recording information on odonate species

FIELD KEY TO ADULT DRAGONFLIES AND DAMSELFLIES

KEY TO GROUPS (SUB ORDERS)

1. Hind wings broader than the forewings; abdomen stout; the wings are held perpendicular to the body.....**Dragonflies (Anisoptera)**.....I(Page-36).

2. Fore and hind wings narrowed at base; similar in size and shape; abdomen slender; usually the wings are kept closed over the body.....**Damselflies (Zygoptera)**.....II(Page-75).



I. KEY TO DRAGONFLY FAMILIES (ANISOPTERA)

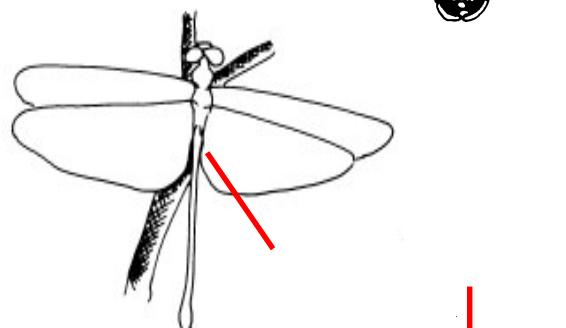
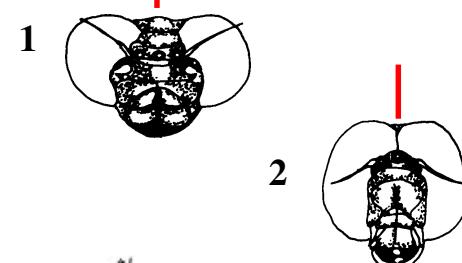
Eyes separated or meeting only at a point.....1.

Eyes broadly touch each other on face...
.....2.

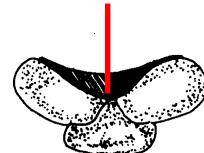
(1)

1a. Large sized dragonflies; black or dark brown marked with yellow; large eyes slightly separated or meeting at a point; cylindrical abdomen swollen at base.....

Mountain Hawks (Cordulegasteridae) (Page-46).



Mountain Hawks

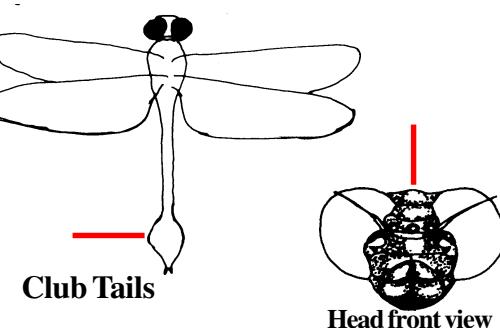


Head front view

1b. Yellow or black dragonflies, marked with yellow or green; never iridescent; eyes well separated; wings moderately broad and never coloured; abdomen often bulbous at the end.....**Club Tails (Gomphidae) (Page-37).**

(2)

Bulbous eyes with a wavy projection at the middle of posterior border.....2a.



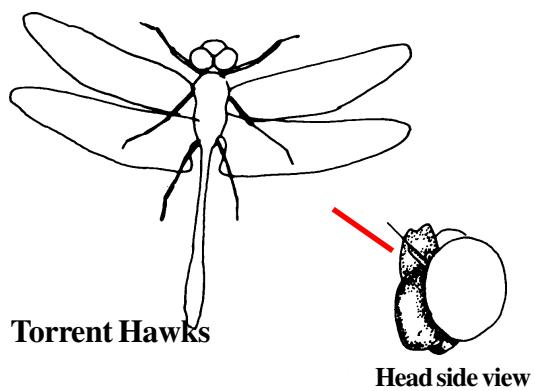
Club Tails

Head front view

Eyes without a wavy projection at the middle of posterior border..... **2b.**

2a. Thorax coloured iridescent green or blue marked with bright yellow; abdomen cylindrical or compressed in females; frequents forested streams.....

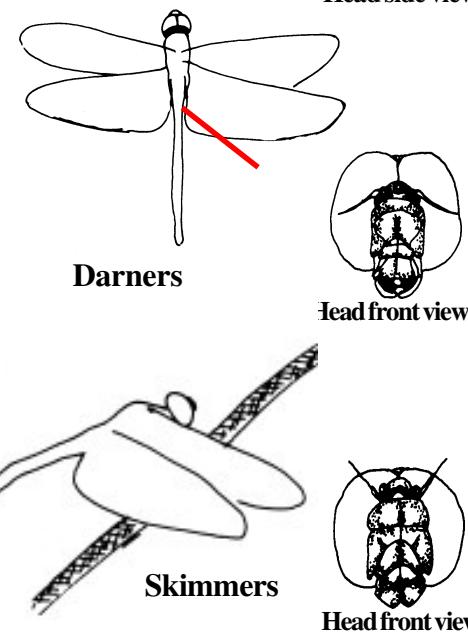
Torrent Hawks (Cordulidae).



Head side view

2b.1. Large sized dragonflies with non-iridescent colour; wings long and moderately broad; abdomen as long as or longer than the wings, tumid at base, often constricted at 3rd segment; found in diverse habitats; often crepuscular.....

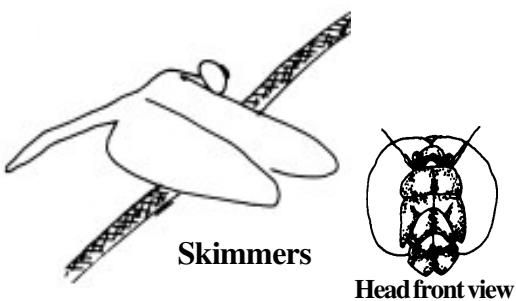
Darners (Aeshnidae) (Page-40).



Head front view

2b.2. Brightly coloured dragonflies, rarely iridescent; sexes are highly dimorphic; abdomen variable in shape; found in diverse habitats.....

Skimmers (Libellulidae) (Page-48).



Head front view

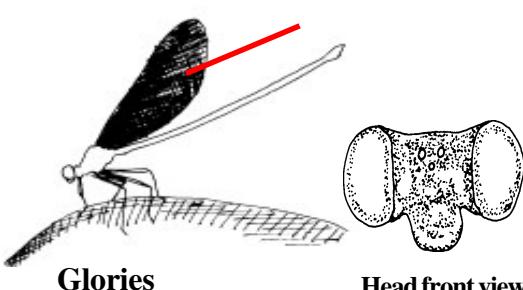
II. KEY TO DAMSELFLY FAMILIES (ZYGOPTERA)

Damselflies with wings and body iridescent or non-iridescent colouration in males; restricted to forested streams..... **1.**

Damselflies with wings and body non iridescent colouration in males; found in diverse aquatic habitats..... **2.**

(1) A. Body or wings with iridescent colouration or markings

(1) a. Large iridescent green damselflies with broad wings; wings are iridescent green or with blue sheen; often tipped with black**Glories (Calopterygidae) (Page-99).**



Head front view

(1) b. Small damselflies with large bulbous eyes; mouth parts project like a snout in front of face; abdomen shorter than wings; opaque hind wings of males with iridescent streaks.....**Stream Jewels (Chlorocyphidae) (Page-103).**

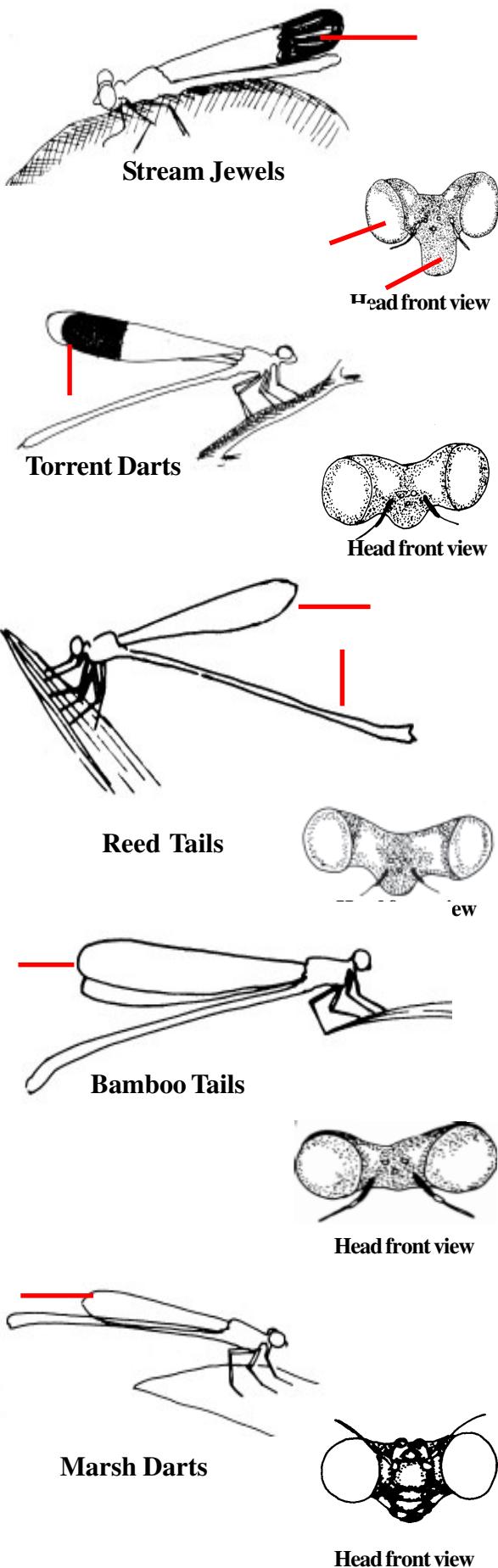
(1) c. Large damselflies; fore wings are broad and taper towards the tip; hind wing short and rounded in some; wings uniformly amber coloured; where hind wings are shorter than the fore wings, they tipped with deep blue on underside and iridescent red on the upper side.....
Torrent Darts (Euphaeidae) (Page-106).

B. Body or wings without iridescent coloration or markings

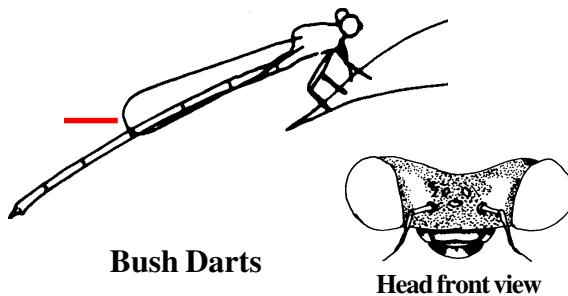
(1) d. Black or brown damselflies with white or rarely reddish or blue markings; narrow wings abruptly bend at the apex; abdomen about twice the size of hind wing**Reedtails (Platystictidae) (Page-89).**

(1) e. Damselflies usually coloured with black with blue markings, rarely with red, yellow or iridescent; wings pointed or rounded at apex, rarely tipped or barred with black; abdomen never twice the length of the wing**Bambootails (Protoneuridae) (Page-91).**

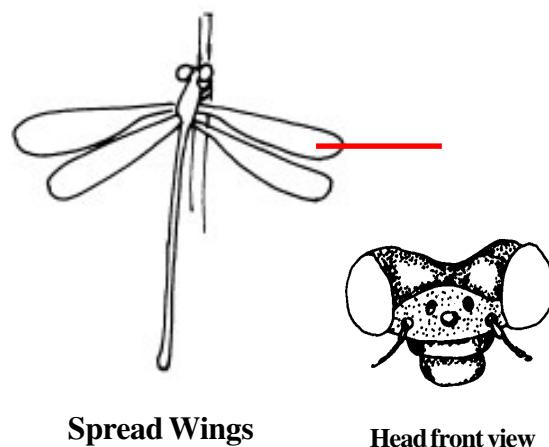
(2) a. Damselflies with non-iridescent or rarely iridescent body; wings narrow and rounded at apex; transparent wings are rarely coloured; found in diverse aquatic habitats.....
Marsh Darts (Coenagrionidae) (Page-76).



(2) b. Black damselflies marked with blue, red, yellow or rarely iridescent; narrow transparent wings are rounded at the apex; abdomen moderately long and never twice the length of the hind wing; found in bushes near aquatic habitats.....**Bush Darts (Platycenemididae) (Page-86).**



(2) c. Damselflies with iridescent or non iridescent markings on head, body and abdomen; transparent wings nearly kept wide open while resting; found in diverse habitats**Spreadwings (Lestidae) (Page-96).**



Size Categories of Dragonflies and Damselflies

Category	Length of Abdomen (mm)
1. Small	10-25mm
2. Medium	26-40mm
3. Large	>40mm

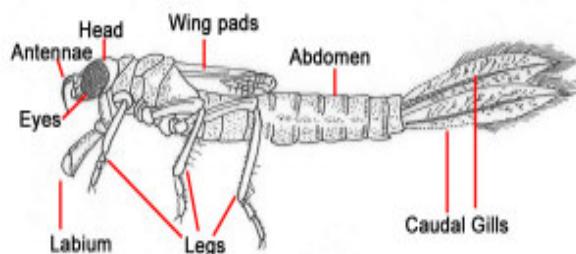
Size range of Dragonfly and Damselfly Families

Family	Category
Dragonflies	
1. Clubtails	Small to Large
2. Mountain Hawks	Large
3. Darners	Large
4. Torrent Hawks	Medium to Large
5. Skimmers	Small to Large
Damselflies	
1. Glories	Large
2. Stream Jewels	Small
3. Torrent Darts	Large
4. Reedtails	Medium to Large
5. Bambootails	Small to Large
6. Marsh Darts	Small to Medium
7. Bush Darts	Medium
8. Spreadwings	Small to Medium

KEY TO THE LARVAE OF DRAGONFLIES AND DAMSELFLIES

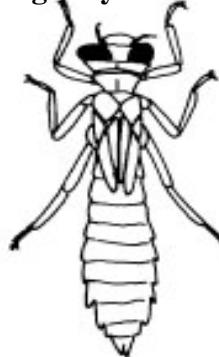
1. Abdomen short and stout, caudal gills absent and terminating in five short spine-like processes.....**Dragonflies (Anisoptera)-I**

2. Abdomen long and slender and terminating in three (rarely two) leaf or sac like caudal gills.....**Damselflies (Zygoptera)-II**



Body Parts of Damselfly Larva

Dragonfly Larva



Damselfly Larva



Labium Flat



Labium Scoop Shaped

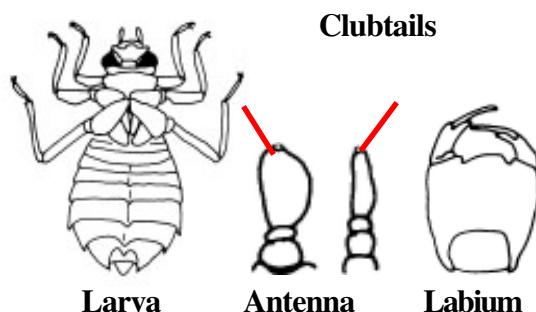
I. Dragonflies (Anisoptera)

Prementum and palpal lobes of labium flat.....**1**

Prementum and palpal lobes of labium scoop or spoon shaped.....**2**

1a. Antennae four-segmented, 3rd segment enlarged and fourth vestigial.....**Clubtails (Gomphidae)**

1b. Antennae six or seven segmented and filamentous.....**Darners (Aeshnidae)**

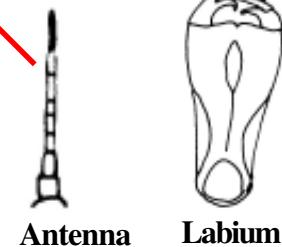


Clubtails

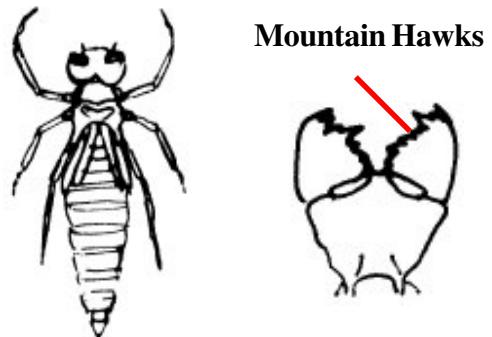


Darners

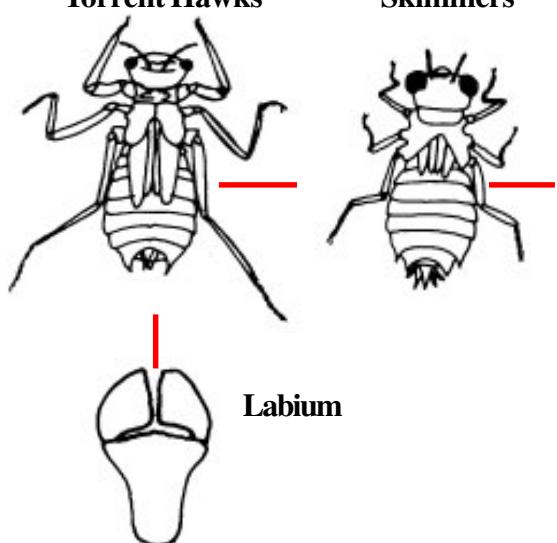
Larva



2a.Body elongate and covered with bristles or tufts of setae, labium with large irregular teeth.....**Mountain Hawks (Cordulegasteridae)**



2b.Hind femur does not extend beyond abdominal segment VIII, labium with small teeth.....**Torrent Hawks and Skimmers (Corduliidae and Libellulidae)**



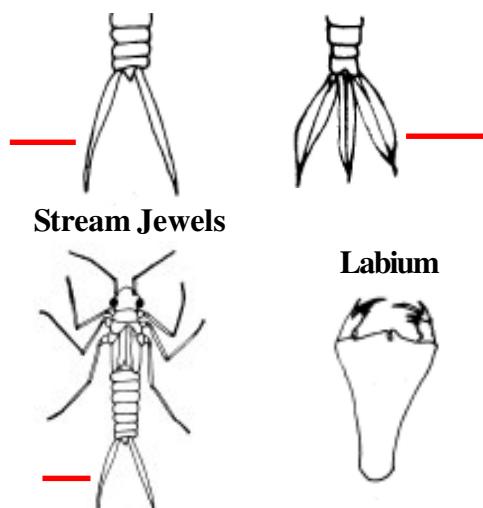
II. Damselflies (Zygoptera)

Two forceps like caudal gills.....**1**

Three leaf, blade or sac like caudal gills.....**2**

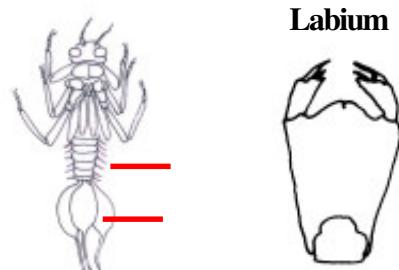
1a.Two forceps like caudal gills, which are triangular in cross section.....**Stream Jewels (Chlorocyphidae)**

Caudal Gills of Damselfly Larva



2a.Filamentous gills on the underside of abdominal segments II-VIII, caudal gills are sac like.....**Torrent Darts (Euphaeidae)**

Torrent Darts



Without filamentous gills on abdominal segments II-VIII.....3

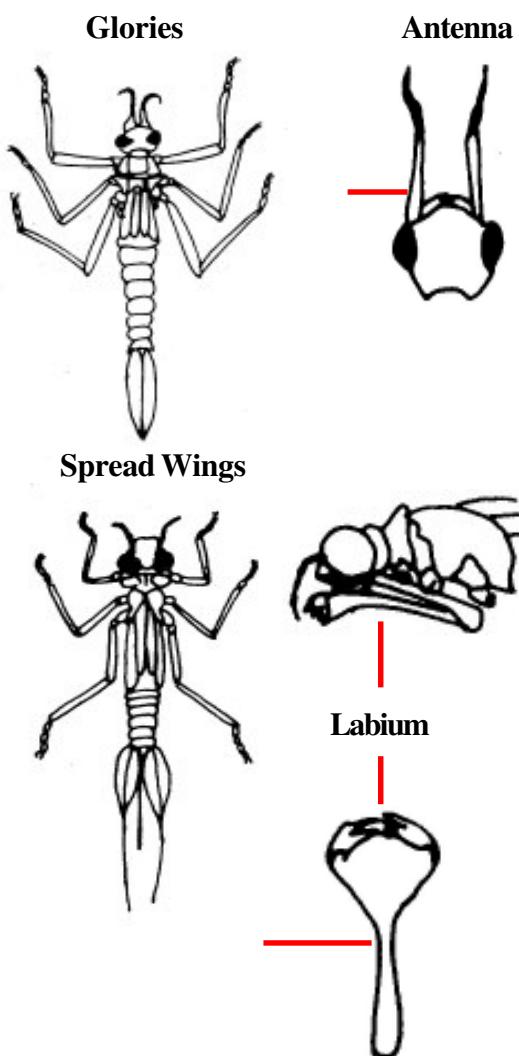
3a. First antennal segment longer than the combined length of other segments; body slender and long, caudal gills blade like with a distinct dorsal ridge.....**Glories (Calopterygidae)**

First antennal segment similar to other segments.....4

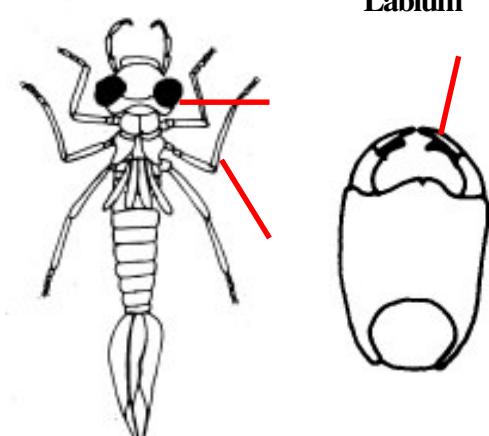
4a. Labium distinctly spoon shaped and strongly tapered posteriorly with large sharp teeth
.....**Spread Wings (Lestidae)**

Labium quadrate or more or less triangular in shape, but not spoon shaped; with movable hooks or spines at the tip.....5

5a. Pale and lanky larvae with large bulbous eyes, labium with single spine and one movable hook.....**Reedtails (Platystictidae)**

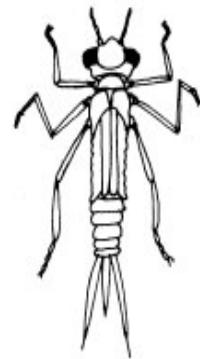


Reedtails



5b. Gills clearly divided into a thickened dark proximal part and a thin, paler distal part.....**Bambootails (Protoneuridae)**

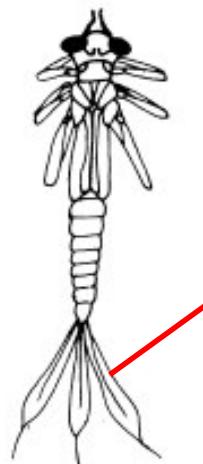
Bambootails



Gills not divided into proximal and distal parts.....**6**

6a. Caudal gills long, about same length as the abdomen, apices pointed or tapering, third segment of antenna longer than the second.....**Bush Darts (Platycnemididae)**

Bush Darts



6b. Caudal gills shorter than the abdomen, with rounded apices third segment of antenna shorter than second....**Marsh Darts (Coenagrionidae)**

Marsh Darts



Head and Antenna



Labium